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STEEL

ESTABLISHED 1882

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PRODUCTION • PROCESSING • DISTRIBUTION • USE

Here's where

SCREW COSTS *mount up*

. . . and where PHILLIPS screws

CUT THEM DOWN

AVERAGE 50% LESS ASSEMBLY TIME

The patented Phillips recessed head means that *every screw is used*. Phillips Screws cling to the driver—none fumbled, even with one hand steadying the work. Phillips Screws are self-centering—none driven crooked. Phillips Screws fit the driver snugly—no reaming action to throw up burrs.

Shape, taper and depth of the genuine Phillips recess were determined after thousands of tests. The recess utilizes the driver's maximum turning power without sacrifice of strength in the screw head . . . without danger of shearing the metal.

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This Booklet will help your plant to cut fastening costs and improve assemblies. Address one of the firms below for free copy.

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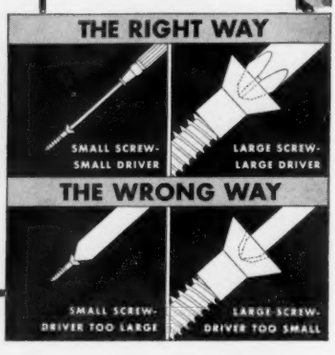
YOU WOULDN'T PLAY EVERY SHOT WITH ONE DRIVER

For efficient driving, contact between recess and driver should extend as far as possible from the screw's axis. On the other hand, too big a driver means stripping threads or tearing fibre structure of wood or metal. Thus it requires four driver sizes to drive properly the entire range of recessed head screws. Two sizes of Phillips Drivers handle diameters No. 5 through No. 16 or approximately 85% of all screws driven.



PHILLIPS *recessed head screws*

MACHINE SCREWS · SHEET METAL SCREWS · WOOD SCREWS · STOVE BOLTS

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Licensor, Providence, R. I.
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IT COSTS LESS TO USE PHILLIPS SCREWS

As the Editor Views the News

■ STEEL production last week (p. 23) continued at 93 per cent of ingot capacity, unchanged from the rate of the previous week. Mills continue to be pressed for deliveries (p. 85) by consumers whose requirements are larger than anticipated. While new buying has subsided, mill order books indicate little likelihood of any notable recession in production over the remainder of this year. . . . Following the lifting of the arms embargo (p. 27) England and France have placed some 3000 additional airplanes with American makers boosting their unfilled orders to approximately $475,000,000. An additional 4000 planes are expected to be placed here shortly. England is planning to place additional large orders in this country for machine tools.

• • •

How steel prices are established was explained last week (p. 17) at hearings of the temporary national economic committee. A vast amount of miscellaneous information and opinion about the industry went into the record. Further steel hearings will be held in January. . . . TNEC (p. 25) announces it will maintain the price "patrol" recently requested by President Roosevelt. Said Senator O'Mahoney: "We note with satisfaction that business leaders have already undertaken to prevent runaway prices". . . . Existing price on high speed tool steels, a large producer announces (p. 22), will be maintained throughout 1940, subject to exception only in case of a general wage advance. . . . Details of Wheeling Steel Corp.'s expansion program (p. 33) are announced.

Hearings in January

• • •

Without a vote by union members, United Mine Workers' executives have levied a special $2 assessment on all miners working five or more days per month (p. 22), to be collected through the check-off system. Total receipts, estimated at $800,000 to $1,000,000, are to be expended for political purposes. . . Establishment of a priority committee by the joint army and navy munitions board, to route foreign war orders so they will not interfere with domestic defense programs, was revealed (p. 26) last week. . . Machinery and Allied Products institute last week (p. 25) submitted to the treasury department a comprehensive plan of taxation aimed at placing the so-called capital goods industries on a sound basis. . . Vessels under construction in the United States, Nov. 1, numbered 245, with 1,184,369 gross tons.

Check-Off For Politics

• • •

When a community, through burdensome taxes or other reasons, loses its large industries it develops a belated appreciation as to the significance of industrial payrolls. A specialist (p. 42) describes a procedure which had led to revived prosperity in a number of communities so affected. In some cases far-sighted corporations have done a good job in industrial relations through helping to find new occupants for abandoned plants. . . . Resistance flash welding of strip steel for continuous operations has progressed to a point where soft welds desired for subsequent cold reduction are produced regularly. Breakage on two recent installations (p. 46) has dropped to approximately 1 per cent. . . . Hearing on a code for dust separators (p. 75) will be held in Philadelphia, Dec. 4.

Finding New Industries

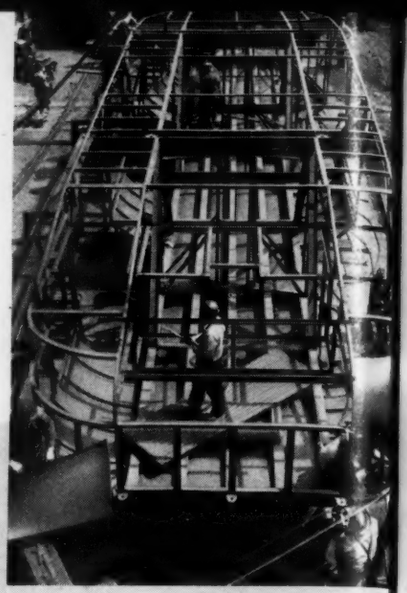
• • •

Influence of American design is quite evident in new blast furnaces and steel plants in Europe (p. 51), reports an American steelworks engineer as a result of a tour abroad. . . . National Cash Register Co. has set up a unique conveyor and power-truck system (p. 54) for handling 480,000,000 parts annually through departments in 28 buildings. . . . Two new tellurium copper alloys (p. 58) are available for forgings and machine screw products. . . . It is suggested (p. 62) that an attempt be made to find the difference in emissivity constants for wild and killed steels so that steelworks metallurgists can discuss temperature effects referred to in a standard scale. . . An authority (p. 66) discusses a number of methods by which best results can be had from the flame hardening process.

American Influence

E C Kreutzberg

(Left) Rear Admiral Richard E. Byrd with the American flag he dropped on his first trip to the South Pole.



(Right) The vast frame—Inland Hi-Steel sections welded together, ready for the skin of Inland Hi-Steel sheets. Rivets would have increased the weight by about 2½ tons.

(Below) The Snow Cruiser, designed and built at a cost of $150,000 by Research Foundation of Armour Institute of Technology—55 feet long, 15 feet wide, 15 feet high.

Antarctic Snow Cruiser is Built of INLAND HI-STEEL

When Rear Admiral Byrd leads the United States claim-laying expedition to Antarctica, Inland Hi-Steel will be a vitally important member of the party.

The expedition's huge snow cruiser—combined de luxe trailer-home, armored tank and scientific laboratory—is constructed of Inland Hi-Steel: the entire frame structure, wheels, floor plates, and outside sheathing.

Inland Hi-Steel was selected as ideal for meeting every requirement of design and fabrication. It is much stronger than ordinary carbon steel—has more than 2½ times the resistance to corrosion. But above all, it has extraordinary ability to withstand repeated high impact shocks at extremely low temperatures.

Here indeed is dramatic evidence of Inland Hi-Steel's ideal applicability, wherever high strength and light weight are necessary. It requires no special equipment or processes for fabricating—welds easily by any method, is readily punched, sheared, machined, or formed. It costs little more than ordinary steel. The Inland Hi-Steel Bulletin will be sent on request.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Steel Leaders Testify in Washington;

Weir Explains Pricing Policy

WASHINGTON

■ HOW steel prices are established was explained to the temporary national economic committee last week by steel industry's leaders. Also figuring in the committee's hearings were the possibility of stabilizing output, competition in the industry, effect of war on the steel business and a vast amount of miscellaneous information and opinion.

Any hopes for early completion of the hearings were dashed by Leon Henderson, representing the securities and exchange commission, who announced further steel hearings will be held in January. Mr. Henderson explained surveys have been made for the United States Steel Corp. by Dr. Theodore Yntema, University of Chicago, and that these will require detailed study before they are presented to the committee officially.

The surveys, it was intimated, deal with many subjects, including the basing point system. Said Henderson: "I may say that, based on what examination I could give to it last night, there is material presented about one of the country's leading companies such as I believe was never available before, and it ought to be of extreme interest to this committee."

Benjamin F. Fairless, president, United States Steel Corp., H. L. Hughes, vice president, and Robert Gregg, president, Tennessee Coal, Iron & Railroad Co., were first steel witnesses. They explained in detail the corporation's activities, subsidiaries and price policies. They explained how and why prices were changed. Mr. Fairless described in detail the structure of the corporation, its operating and selling agencies.

At the request of A. H. Feller, government counsel, he told how prices are changed within the corporation itself. Recommendations for price changes, either up or down, are made by the subsidiary companies. Reasons for the changes are included with the recommendations.

Recommendations for price changes now are made to the Delaware corporation and have been ever since its organization in January, 1938. Any price changes must be finally approved by the president.

Mr. Fairless said that before any recommendations are made by the subsidiaries they make a complete study of general business conditions, competition and other elements.

Mr. Fairless said there were two price increases in 1936, one increase in 1937 and a decrease in 1938. Speaking of 1936, he said that the first increase was in May and dealt only with certain products; the other increase was in December and was general.

The May increase was necessitated because certain products had gotten out of line with prices of other products and failed to show a profit.

One reason for the general price increase in December, 1936, Mr. Fairless explained, was increased labor costs which amounted to about 10 per cent. Labor also was granted vacations with pay. At about the same time raw material prices were increased.

Mr. Fairless continued that the price increase in the first quarter of 1937 was due to further increases in labor and material costs. Consumers were really expecting the in-

Bethlehem Executives At Hearing

■ Left to right: E. G. Grace, president, Paul Mackall, vice president, and F. A. Shick, vice president and comptroller. Acme photo

crease because they knew the corporation's costs had risen. He explained that the corporation is in constant touch with its buyers.

One factor in the corporation's decision not to lower prices in the fall of 1937 was the advice of its economists that the recession would be short-lived. Reduction in steel prices does not usually bring an upsurge in steel orders, provided the price in the first place is not fictitious, he contended. Mr. Feller placed in the record a cablegram of June, 1938, sent by Edward R. Stettinius Jr., U. S. Steel chairman, to Myron C. Taylor, former chairman, in Paris.

The message advised Mr. Taylor of steel "price reductions to meet competitive conditions and with the hope that such reduction will stimulate a demand for steel products."

Mr. Feller asked Mr. Fairless if the increased demand for steel products referred to by Mr. Stettinius in his message ever materialized, but Mr. Fairless refused to be drawn into any argument on that subject, saying the figures could "speak for themselves."

Mr. Feller then asked what was the point in announcing a reduction in the published price of steel when actual prices were not changed materially.

"There was a lot of talk in the newspapers and in other quarters about the beneficial effect of a price reduction so we thought we'd try it," the witness declared.

"Did you hope a cut in the published price would stimulate your business?"

"No Rails For Inventory"

"We hoped exactly what we said. I don't think there's any mystery about that. It speaks for itself. I'm not opposed to price reductions, but I say that our business, because of its peculiar nature, does not react like some other industries to price reductions. People don't buy steel rails for inventory."

Mr. Fairless explained to the committee that steel prices do not go into effect on the day on which they are supposed to in many instances because contracts have been made in a previous quarter. At times, he stated, deliveries are made as long as six months after new and higher prices have been effective because of contracts entered before the price change. He cited such cases as shipbuilding and bridges, etc. Frequently, also, he explained, his company adjusts prices if deliveries are made when prices have been lowered.

Asked by Mr. Feller if he thought 1937 price increases were justified, Mr. Fairless said in his opinion they were. He said that when competition is especially keen in the steel industry, with orders falling off, it is frequently necessary to sell goods at cost and many times at less than cost.

Questioned by the committee Mr. Fairless said that prices are reasonable in his company when they return a fair profit and unreasonable when the price allows too much return or when some other firm is able to take the business away from him.

The witness was questioned closely by Leon Henderson as to whether he thought steel prices had to be higher in 1937 than they were in 1929. Mr. Fairless spoke of increased labor and other costs and Henderson called attention to the technological developments in the industry since that time. Mr. Fairless said that there were great developments in some branches of the industry but not in all. He pointed out that during that period labor costs jumped as much as 40 per cent in the steel industry. He said also that taxes increased during that period as well as the cost of raw materials. He testified that labor costs in the industry are from 40 per cent to 50 per cent of the total cost of making steel.

Wants Only Fair Price

During the discussion on this subject, Mr. Henderson tried to make Mr. Fairless say that in the future the committee and the nation must to look forward to higher steel costs than comparative costs in other industries. Henderson cited bureau of labor statistics tables to show that such was the case between 1929-1937. Mr. Fairless told Henderson that he is a steel manufacturer and not an economist. He also told Henderson the corporation's prices are based on facts and not on theories.

Regarding the corporation's pricing policy, Mr. Fairless said that at no time does it want to charge more than a fair price for its products. It wants prices high enough to pay its labor a fair wage, to allow the best working conditions possible, to allow the corporation to keep its properties in excellent condition, to keep its equipment modernized, to allow it to continue its experimental work and to allow a reasonable re-

Earnings, Assets, U. S. Steel Corp. Subsidiaries

	Earnings (Before Interest)	Net Assets (Assets less Current Liabilities)	Ratio of Earnings to Net Assets Per Cent
1920	$139,043,581	$2,273,801,768	6.12
1921	65,109,283	2,254,856,754	2.89
1922	68,020,445	2,241,899,632	3.03
1923	136,718,703	2,283,479,677	5.99
1924	112,377,701	2,291,235,548	4.90
1925	117,711,771	2,328,725,168	5.05
1926	143,425,343	2,333,017,257	6.15
1927	113,960,340	2,324,660,536	4.90
1928	139,919,784	2,329,514,233	6.01
1929	212,536,930	2,157,164,530	9.85
1930	110,061,667	2,277,566,636	4.83
1931	18,507,766	2,214,480,212	0.84
1932	*65,862,244	2,110,235,191	*3.12
1933	*31,336,670	2,047,876,024	*1.53
1934	*16,616,728	2,027,821,920	*0.82
1935	6,106,488	1,752,870,594	0.35
1936	55,501,787	1,760,418,809	3.15
1937	100,085,446	1,801,398,218	5.56
1938	544,874	1,632,017,676	0.03

Earnings are before interest but after all other charges, including all taxes. *Indicates loss. This was one of U. S. Steel Corp.'s exhibits at the temporary national economic committee hearing in Washington last week.

"Ratio of Steel Extras to Total Price"

■ According to an analysis made by the department of justice for the temporary national economic committee, and submitted last week, the extras in a group of ten selected steel products shipped in February, 1939, amounted to 9.9 per cent of the total invoice delivered value of these products. This average covered a wide range, from 0.7 per cent in the case of cold-rolled sheets to 29.7 per cent on cold-rolled strip. The figures as to each product and the aggregate for the group appear in the following table:

Product	Total invoice delivered value	Tons	Extras per ton	Extras as percentage of delivered value	Extras as percentage of calculated base price
Sheet and tin plate bars	$ 248,875	8,198	$ 0.5	....	....
Wire rods	1,220,140	27,141	2.56	5.7%	6.4%
Plates	4,749,948	96,443	4.02	8.2	9.5
Heavy structural shapes	3,802,049	79,921	1.89	4.0	4.6
Sheets, hot-rolled and hot-rolled annealed	9,866,083	190,910	9.70	18.8	24.5
Strip, hot-rolled	3,298,084	67,896	6.04	12.4	15.2
Sheets, cold-rolled	5,176,127	82,919	0.45	0.7	0.8
Strip, cold-rolled	1,660,086	17,728	27.79	29.7	45.0
Tin plate (95-pound box)*	2,975,082	29,036	—4.02	—3.02	—4.0
Plain wire, drawn	995,309	17,166	3.96	6.8	7.8
All products	$33,991,783	617,358	$5.43	9.9%	11.6%

* Extras on tin plate are quoted per base box rather than per unit of weight. Base boxes lighter than 100 pounds, take deductions, or "negative" extras, and boxes heavier than 100 pounds, take "positive" extras. Figures and text from government's exhibit.

turn to its stockholders. The witness told the committee that in a normal year the corporation should book about 50,000 tons of steel a day, domestic and export.

Answering committee questions Mr. Fairless said there is no standard as to how far his company will go to get an order. The company, he stated, might go even below the cost of production to get an order to keep labor employed. One week, he said, the corporation might not want to take an order at a low figure while the following week it might take the same order, depending, he said, upon conditions.

He told the committee that the corporation has about 35 per cent of the steel producing capacity of the country and that therefore it should get about 35 per cent of the business. Mr. Fairless said that at the present time the corporation has to be going about 50 per cent of capacity to "break even." This figure is subject to change, he said, depending on conditions.

Differentials at Birmingham and Chicago were abolished in June, 1938, Mr. Fairless told the committee but there still are some differtials left.

West Coast Costs Higher

Questioned regarding the west coast situation the witness said that the cost of making steel in San Francisco is more than it is in Pittsburgh, due, among other things, to the freight on raw materials. Full range of steel products are not made there because there is not enough call for many of them. Steel prices on the coast are lower than the base price in the East plus freight rates. Users of plates, for instance, on the Pacific coast are not penalized as compared with the same users on the East coast.

Considerable time was spent on the question of extras. Mr. Fairless explained extras in some detail and said that the book of extras is the "salesman's bible." Cost of the special job, he said, is the basis for the extras.

Mr. Fairless explained that cost of extras is arrived at with competitors. Conferences, he said, are not held through the American Iron and Steel institute although he stated that the institute has many committees working on various problems. The steel industry couldn't be operated if it didn't have standards.

Mr. Fairless testified the main purpose of the revision of extras which accompanied the lowering of base prices of steel in June of last year was to remove confusion as to prices and naming of products, and "to match our merchandising policies with new production methods."

"There isn't a steel man in the country who's not perfectly at liberty to do what he wants regarding extras or any other price. They are under no contractual obligations and no moral obligations to the United States Steel Corp."

The witness repeatedly stated that the consultations to determine costs were "not price-fixing."

Mr. Fairless declared that while his company conferred with competitors concerning costs involved in the pricing of extras, the extras announced by the United States Steel Corp. were based on its own costs. He stated the extras are changed frequently, due to competition in certain products and for other reasons.

Corporation counsel has advised there is nothing illegal about the meetings.

Speaking of the American Iron and Steel institute, Mr. Fairless said:

"We have technical committees, manufacturing committees, in our institute that make studies of various phases, but they don't fix the price. They don't fix the price charged for these special services rendered, but they do make analysis of the costs and studies of the costs, and since our motive is only to charge cost for services rendered, then obviously it is our duty to develop the best cost that exists, not only within our own company but within this industry."

Asked how long the practice had been followed in the industry, Mr. Fairless replied:

"For probably as long as the steel industry has existed—it has been going on the 25 years that I've been in it."

Mr. Fairless was questioned about semifinished steel at some length. He testified that the Steel corporation sells semifinished steel to both integrated and nonintegrated mills and to other customers who need it for their own use. He told the committee that his company sells these semifinished products to nonintegrated mills at a price that will allow them their profit and also allow them to compete with the Steel corporation itself and others.

Mr. Feller tried to make Mr. Fairless say that the corporation could keep the nonintegrated mills' margin of profit down to such a low point that it would force the nonintegrated mill out of business. Mr. Fairless said that he had never known such a case and while it might be so as far as theory is concerned it would not work out in practice because it would simply lose a customer for semifinished products.

Little Fellows Treated Fairly

The witness said that at times the corporation had sold semifinished products to nonintegrated mills at cost so that they could stay in business. He testified that over a period of the past nine years nonintegrated mills have shown more profit than have integrated mills. This is because of the huge investment involved in the integrated mills which works against them in depression periods.

Mr. Fairless told the committee his company is a large purchaser of raw materials and that the corporation is really not an entirely integrated organization for that reason. The corporation, he said, is the largest producer of semifinished products in the United States and the corporation customers are kept in a competitive state because the corporation gives them all a fair price.

Semifinished market is sometimes more competitive than the finished market. The general price policy of the corporation does not change when the market becomes better.

At this point the question of tin plate was taken up and Dr. H. A. Baker, president, and A. R. Pfeltz, vice president, American Can Co., were put on the stand with Mr. Fairless.

Mr. Fairless told the committee tin plate is a light-gage steel product coated with tin and explained that it is largely used in canning,

"No War Boom in Steel"

■ **Speculation in steel based on anticipated increases in exports to belligerents and neutrals likely will be disappointing, Prof. M. G. de Chazeau, University of Virginia, told the temporary national economic committee last week. The professor was retained by the department of justice to assist in preparing the government's case for the steel hearings. NEA photo**

paint and oil cans. He stated that one and a half pounds of pig tin is used for each base box of tin plate. Tin used in the making of tin plate amounts to about 20 to 30 per cent of the total cost of the finished product.

Dr. Baker told the committee his company buys tin plate from about ten companies but the largest amount is purchased from Carnegie-Illinois Steel Corp., Pittsburgh. He testified his company is the largest can manufacturer in the country with Continental next and either National or Crown coming third. He said that there is keen competition in the can manufacturing industry.

Dr. Baker said his company manufactures about ten billion cans a year. Packers' cans, he explained, are food cans in which the product is sterilized.

Tin Plate on 12-Month Contracts

The witness said he had made a contract in 1927 with the American Sheet & Tin Plate Co., for partial requirements. In 1931 another contract was made with the same company. The next contract in 1936 was with Carnegie-Illinois which had absorbed American Sheet & Tin Plate. He said Carnegie-Illinois is the largest supplier of tin plate in the country. He has contracts now for tin plate with Carnegie-Illinois; Republic Steel Corp., Cleveland; Bethlehem Steel Co., Bethlehem, Pa.; Youngstown Sheet & Tube Co., Youngstown, O.; Granite City Steel Co., Granite City, Ill.; and Jones & Laughlin Steel Corp., Pittsburgh.

Mr. Feller through reading existing contracts into the record showed that all of the contracts of American Can for tin plate are based on the officially announced price of Carnegie-Illinois.

Mr. Fairless explained some of the background of the tin plate industry. He said it is different from any of the other steel products and explained contracts are made for 12 months as compared with 90 days for other products. Therefore the manufacturers have to gamble with future conditions which is not the case in other steel products with a short term contract.

During the course of the discussion Dr. Baker told the committee he had changed the contract to his customers for cans. He said the committee's investigation had caused him to make the change and that the new contract was drawn as of early in October of this year.

The question of this contract change came about, Mr. Feller explained, when he had a conference with Dr. Baker at the department of justice a short time ago. The attorney introduced a statement made to him regarding the contracts by Dr. Baker as follows:

"Theoretically this (the new contract) seems to take care of all the things which our customers might expect us to take care of and all of the things we have thought it probable that you gentlemen would also like to have taken care of. Maybe some of your inspiration is back of this."

Dr. Baker discussed the bearing which tin plate contracts have on can manufacturing contracts. His company has a provision in its contract with the tin plate manufacturers to provide for a reduced price to the company if the tin plate price is reduced after contract is made. Dr. Baker said that all or most of this is given to his can customers.

A suit instituted by the can company against Carnegie-Illinois, which never came to trial but which was settled out of court, was discussed. The can company was paid $2,250,000, it was said. This dealt with a 7½ per cent discount over which there had been a difference of opinion. The can company taking the position, said Dr. Baker, that it should be allowed 7½ per cent discount under the price received by other purchasers, which would have allowed the can company 15 per cent under the base price rather than 7½ per cent as argued by Carnegie-Illinois. Witness said that no part of this $2,250,000 was paid back to the can company customers.

"Antitrust Laws not Vague"

A letter from Mr. Pfeltz to Mr. Fairless was introduced. Feller stressed one paragraph in which Mr. Pfeltz recalled the conversation dealt with "control over metal trade journals in the publication of prices on tin plate, and the elimination of such comments as are foreign to the subject."

Mr. Feller questioned both Mr. Fairless and Mr. Pfeltz closely as to just what this meant. Both denied their corporations had any financial interest in any trade papers or that they had any control over them. Mr. Pfeltz said that frequently minor officials of companies make statements to representatives of trade journals which should not be made and he wanted to guard against this.

Nathan L. Miller, general counsel for the steel corporation, told the committee the antitrust laws are not "vague and indefinite" and there

How Finished Steel Prices Have Fluctuated Since 1926

■ Chart based on monthly averages of STEEL'S composite of finished steel, including plates, shapes, bars, hot-rolled strip, nails, tin plate and pipe. Trend of finished steel was one of the subjects discussed at the temporary national economic committee hearing in Washington last week

should be no difficulty in enforcing them.

"I cannot say as much for the definiteness of the Robinson-Patman act," Mr. Miller stated in presenting for the record two memoranda which he prepared in June, 1932, at the request of W. A. Irvin, then president of the corporation, on the rights of the steel companies under the antitrust laws then existing, the Sherman and Clayton acts.

In presenting his memoranda, Mr. Miller told the committee he had informed Mr. Irvin in 1932 that "there it not so much confusion about these laws as people generally suppose."

Mr. Irvin had forwarded copies of the memoranda to officers of the corporation's subsidiaries for their guidance.

One related to the antitrust laws as affecting "relations with competitors" and the other to the bearing of the laws on "sales methods," the latter being outdated in some respects by enactment of the Robinson-Patman act.

Among Mr. Miller's instructions in the memorandum on relations with competitors was the following paragraph which he cited as illustrative of what the executive could and could not do.

Feels Responsibilities Keenly

"It is permissible to inform competitors of one's prices in the past. It is not permissible to state what the future prices are going to be, because that necessarily involves the obligation, either moral or otherwise, to charge the prices named. It is permissible to call attention to the demoralization resulting from price-cutting. It is not permissible by any sort of concerted action to use coercive measures, promises or threats to influence a competitor not to cut prices. The periodic exchange of information on capacity, sales, prices and the like will naturally tend to stabilization, but that is permissible since it is the result solely of enlightened self-interest. It ceases to be permissible only when there is introduced some element of agreement, 'gentlemen's' or otherwise, or of concert of action designed to coerce or restrain free and independent action."

Just before he was excused Mr. Fairless told the committee that "we feel keenly the responsibilities of 235,000 workers whose daily bread depends upon our decisions." In making a last minute statement, Mr. Fairless continued:

"You must remember some 40,000 of our workers have invested their savings in shares of stock of our corporation. Close behind them are the thousands of supply dealers and shopkeepers, large and small, in the cities, towns and villages where our plants are located. Then there are the 220,000 stockholders, most of whom have had a lean time of it since 1931, the common stockholders having received only one dividend of $1 per share, paid in 1937. And finally—I do not put them last—there are our customers and the general public whom we serve. We feel it is our duty to work with and protect each of these groups to the best of our ability.

"The mere fact that our losses have been quite consistent, as well as substantial, since 1930, except in three years, should indicate that the price of steel has been so low that, with the volume we have had, only a meager profit has been made during this nine-year period.

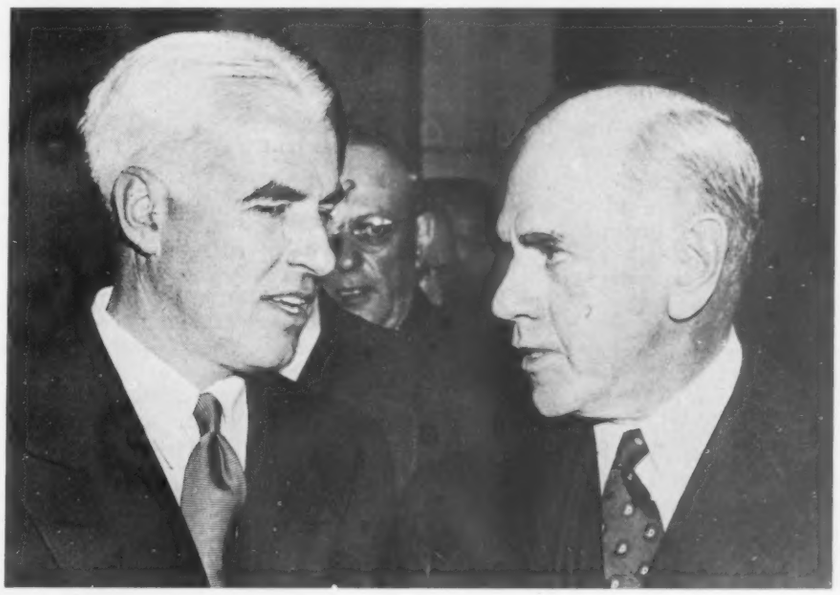
"We have spread the work in poor years, and by this means have been able to keep an approximate average of 60,000 men employed beyond the strict needs of the business available. At every point we have done our best to co-operate with the government in the efforts to improve the distressing conditions which have prevailed. These are the facts of the great, prolonged depression through which we have been passing.

"While we sincerely desire to provide constant and regular employment for our employes, I cannot recommend following any untried theory in this important and complex business in attempting to accomplish this result. I have to move cautiously, taking into consideration all of the basic factors of the steel industry and seeking all the help and advice I can get from the experienced men around me.

"We have spent our business lives in the industry and I think are fully qualified to deal with the problems of the United States Steel Corp."

E. G, Grace, president, and Paul Mackall, vice president, Bethlehem Steel Corp., followed the U. S. Steel witnesses. Mr. Grace described Bethlehem's organization. He explained the corporation is the holding company while the company itself is the operating, manufacturing and selling subsidiary of the corporation.

All subsidiaries, the witness explained, are definite parts of Bethlehem and not individual companies as in the case of the Steel corporation. Mr. Grace said his company believes this organization makes for more consolidation and efficiency, and simplicity of management.



■ **E. R. Stettinius Jr., chairman, United States Steel Corp., left; and E. G. Grace, president, Bethlehem Steel Corp., at Washington hearing. Acme photo**

Mr. Grace said his company owns and controls and in many cases operates its own iron ore mines. Bethlehem has three sources of ore, he stated, one in the Lake Superior district, one in central Pennsylvania and a third in foreign countries, Cuba and Chile. The foreign properties are mined by the company. He estimated that about 2,000,000 tons of ore are imported from the Bethlehem foreign mines.

Main company steel plants are at Bethlehem, Lackawanna, N. Y., Johnstown, Pa., Pittsburgh, Harrisburg, Pa., Sparrows Point, Md., San Francisco, Los Angeles, and Seattle. Three largest steelmaking plants are at Sparrows Point, Lackawanna and Bethlehem. He told the committee that in addition to steelmaking Bethlehem has ship-

(*Please turn to Page* 82)

High Speed Tool Steel Price Holds

■ FIRTH-STERLING STEEL CO., McKeesport, Pa., large producer of high speed and other tool steels, announces today that it will maintain throughout 1940 the present 67-cent price on standard 18 per cent tungsten high speed steel. Among tool steel makers, this grade accounts for two-thirds of the total production in high speed steel.

This price guarantee, it was pointed out, will apply except in the event that there should be a general wage increase throughout the tool steel industry, in which case only such price increases as would cover the increased labor cost would be considered.

L. Gerald Firth, president, said the action is in line with the government's effort to stabilize prices on certain strategic materials.

"It is our immediate objective," he explained, "to refute disturbing rumors of an imminent price increase in high speed steel. Such fears may be associated with recollections of the sky-rocketing prices on this commodity during the World war when prices quadrupled in a short period. There is now no occasion to repeat such an experience, particularly since we fear no tungsten shortage.

"The present favorable tungsten situation has been brought about largely through government effort to encourage long range development of the American tungsten industry. In our own case, through ownership of Wolf Tongue Mining Co., with tungsten mines in Colorado, we are assured a continuous supply of high grade tungsten ore in sufficient quantity to meet consumer needs."

Estimates 12 Per Cent of Steel Is Going Into Stock

■ Urging the scrap industry to keep a watchful eye on the rate of steel consumption especially after the turn of the year, and also to observe closely developments in the European war situation, E. C. Barringer, executive secretary, Institute of Scrap Iron and Steel Inc., addressed 30 members of the Michigan chapter of the institute in Detroit, Nov. 8.

Analyzing the current rate of steel production, Mr. Barringer estimated that about 12 points of the present 90 per cent rate could be figured as steel going into inventories. The latter, of course, must be expanded as the rate of steel consumption increases, but a condition of overbuying might suggest caution in appraising the outlook for the first quarter.

He explained various features of the revised neutrality act and observed that future prospects for exports of raw materials, such as scrap iron and steel, were not so bright because of the fact fewer cargo ships would be available and thus they would have to concentrate on transport of finished products.

The chapter adopted a resolution empowering a committee to discuss with state officials the exemption from sales tax of commodities used in the processing of scrap, such as coal, power, oil and replacement parts.

FINANCIAL

COPPERWELD ASKS AUTHORITY TO INCREASE INDEBTEDNESS

■ COPPERWELD STEEL CO., Glassport, Pa., has asked stockholders to authorize an increase in indebtedness from $500,000 to $3,000,000 to provide funds for construction of the proposed electric steel plant in Warren, O. Financing may consist of $2,000,000 in bonds and 10,000 shares of $50 par value serial preferred stock. Plant, with capacity of 100,000 tons of alloy steel annually, is designed to produce steel for use in manufacture of copper-covered steel wire, rods and strands.

Universal-Cyclops Steel Corp.

Universal-Cyclops Steel Corp., Bridgeville, Pa., reports third quarter net profit of $199,676, equal to 39 cents a share, compared with $76,213 or 15 cents per share for second period, and $25,447, equal to 5 cents a share for third quarter, 1938. Nine months net profit, $447,412, is equal to 89 cents a share; for corresponding 1938 period, $9667 or 2 cents per share.

DIVIDENDS DECLARED

Harbison-Walker Refractories Co., Pittsburgh, 55 cents on common, payable Dec. 1 to record of Nov. 16. Company paid 15 cents in each of the prior three quarters this year.

Allis-Chalmers Mfg. Co., Milwaukee, extra of 25 cents in addition to regular 25 cents on common, both payable Dec. 22 to record of Dec. 1.

Copperweld Steel Co., Pittsburgh, 20 cents on common, and regular quarterly of 62½ cents on preferred. Both payable Dec. 10 to record of Dec. 1.

Vanadium-Alloys Steel Co., Latrobe, Pa., 50 cents, payable Dec. 2 to record of Nov. 18.

Caterpillar Tractor Co., Peoria, Ill., regular quarterly of 50 cents on common, payable Nov. 25 to record of Nov. 15.

Pittsburgh Coke & Iron Co., Pittsburgh, regular $1.25 quarterly on $5 preferred, payable Dec. 1 to record of Nov. 21.

Savage Arms Corp., New York, 75 cents on common, payable Nov. 15 to record of Nov. 9.

M. A. Hanna Co., Cleveland, regular $1.25 quarterly on preferred, payable Dec. 1 to record of Nov. 16.

LABOR

REPUBLIC TO APPEAL LABOR RULING TO SUPREME COURT

■ REPUBLIC STEEL CORP., Cleveland, last week announced it will appeal to the United States Supreme Court a ruling by the federal circuit court of appeals at Philadelphia largely upholding the national labor relations board's order against the corporation.

Appellate court's decision directed Republic to reinstate 5000 workers involved in the 1937 strike, pay them $7,500,000 back wages, disestablish "company-dominated" unions, cease an alleged program against the Steel Workers Organizing committee, a Congress of Industrial Organizations affiliate.

Court held the labor board should have excluded 40 strikers guilty of violence and law violations in the 1937 strike from the reinstatement order.

Republic's statement, issued before its officials had studied the court's decision in detail, said: "With reference to the men involved in the strike, it has been the policy of the company to return to work all except those who were guilty of violence as soon as possible. As a result of this policy all but a relatively few have been returned to work at the present time."

MINERS' UNION LEVIES SPECIAL $2 ASSESSMENT

United Mine Workers' executives have levied, without vote of the union's members, a special $2 assessment on all miners working five days or more per month. Funds so raised are to be used for political purposes. Total income, it is estimated, will run between $800,000 and $1,000,000. The union, controlled by John L. Lewis, represents a closed shop, and as such receives membership dues directly from employers who deduct the money from employes' pay.

■ Orders for electric industrial trucks and tractors reported to the bureau of the census totaled 99 in September, compared with 53 in August and 59 in September, 1938. For nine months orders were 626, against 510 in the corresponding period last year.

Ingot Output Sets New Record

■ PRODUCTION of 5,393,821 gross tons of open-hearth and bessemer steel ingots in October set an all-time record, according to the American Iron and Steel institute. The prior record month was May, 1929, when 5,286,246 tons were made, October's output exceeding this by 107,575 tons.

October production was 28 per cent greater than 4,231,310 tons made in September, and 74 per cent above 3,105,985 tons in October, 1938.

Averages 89.17% in October

During October the steel industry operated at an average of 89.17 per cent of capacity, compared with 72.41 per cent in September, and 52.25 per cent in October, last year. In May, 1929, when annual ingot capacity was approximately 10,000,000 tons less, or 14 per cent, than in 1939, the industry operated at full capacity.

A weekly average of 1,217,567 tons in October compares with 988,624 tons in September, and 701,125 in October, 1938.

Cumulative production for ten months is 35,141,863 tons, at 59.20 per cent of capacity, compared with 21,053,116 tons, at 36.06 per cent, in the period in 1938, an increase of 66 per cent.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Nov. 11	Change	Same week 1938	Same week 1937
Pittsburgh	94	+ 1	48	32
Chicago	91	None	58	35
Eastern Pa.	84	+ 4	35	38
Youngstown	93	+ 1	66	43
Wheeling	93	None	64	54
Cleveland	87.5	— 2.5	77	35
Buffalo	90	— 3	49	32.5
Birmingham	94	None	68	54
New England	90	—10	72	30
Cincinnati	87	— 3	75	15
St. Louis	77	— 3	51.5	33.3
Detroit	100	None	82	82
Average	93	None	61.5	39

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)
(Tons)

	1939	1938	1937	1936
Jan.	789,305	518,322	1,149,918	721,414
Feb.	677,994	474,723	1,133,724	676,315
March	767,910	572,199	1,414,399	783,552
April	701,459	501,972	1,343,644	979,907
May	723,165	465,081	1,304,039	984,097
June	733,433	478,057	1,268,550	886,065
July	676,309	441,570	1,186,752	950,851
Aug.	803,822	558,634	1,107,858	823,703
Sept.	985,050	577,666	1,047,962	961,803
Oct.	1,218,545	663,287	792,310	1,007,417
Nov.	.....	679,653	587,241	882,643
Dec.	.....	694,204	489,070	1,067,365
Adj.*	.....	‡30,381	†77,113	†40,859
Total	.....	6,655,749	12,748,354	10,784,273

*Yearly adjustment. †Deduction. ‡Increase.

Steel Ingot Statistics

	Calculated Monthly Production—All Companies —Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
1939	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.	3,026,710	54.96	147,642	27.26	3,174,352	52.48	716,558	4.43
Feb.	2,792,267	56.15	196,382	40.16	2,988,649	54.72	747,162	4.00
March	3,210,481	58.30	194,889	35.99	3,405,370	56.30	768,707	4.43
April	2,768,269	51.91	205,977	39.28	2,974,246	50.78	693,297	4.29
May	2,752,549	49.98	170,326	31.45	2,922,875	48.32	659,791	4.43
June	2,937,622	55.08	187,666	35.78	3,125,288	53.35	728,505	4.29
July	2,932,924	53.38	229,610	42.49	3,162,534	52.40	715,505	4.42
Aug.	3,516,219	63.85	247,199	45.65	3,763,418	62.22	849,530	4.43
Sept.	3,933,885	73.94	297,425	56.84	4,231,310	72.41	988,624	4.28
Oct.	4,988,416	90.58	405,405	74.86	5,393,821	89.17	1,217,567	4.43
10 mos.	32,859,342	60.80	2,282,521	43.10	35,141,863	59.20	809,161	43.43
1938	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.	1,634,224	30.28	99,941	18.27	1,734,165	29.17	391,459	4.43
Feb.	1,572,009	32.26	125,443	25.39	1,697,452	31.63	424,363	4.00
March	1,846,517	34.21	157,687	28.82	2,004,204	33.72	452,416	4.43
April	1,786,942	34.19	132,100	24.93	1,919,042	33.34	447,329	4.29
May	1,669,455	30.93	131,422	24.02	1,800,877	30.30	406,519	4.43
June	1,513,715	28.96	119,128	22.48	1,632,843	28.36	380,616	4.29
July	1,846,319	34.29	127,998	23.45	1,974,317	33.29	446,678	4.42
Aug.	2,340,363	43.36	196,739	35.96	2,537,102	42.68	572,709	4.43
Sept.	2,440,192	46.80	206,937	39.15	2,647,129	46.09	618,488	4.28
Oct.	2,882,827	53.41	223,158	40.78	3,105,985	52.25	701,125	4.43
10 mos.	19,532,563	.....	1,520,553	.....	21,053,116	.....	484,759	43.43
Nov.	3,357,167	64.23	201,196	37.97	3,558,363	61.81	829,455	4.29
Dec.	2,971,834	55.19	158,912	29.11	3,130,746	52.79	708,314	4.42
Total	25,861,564	40.71	1,880,661	29.20	27,742,225	39.65	532,072	52.14

Percentages of capacity operated for 1939 are calculated on weekly capacities of 1,243,153 gross tons open-hearth ingots and 122,248 gross tons bessemer ingots: total, 1,365,401 gross tons: based on annual capacities as of Dec. 31, 1938, as follows: Open-hearth ingots, 64,817,994 gross tons; bessemer ingots, 6,374,000 gross tons.

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots: total, 1,341,856 gross tons: based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

PRODUCTION

OPERATING RATE LEVELS OFF AT 93 PER CENT

■ STEELWORKS operations last week remained steady at 93 per cent, minor changes in various districts canceling each other. Increases were made in three districts and slight declines in five, four remaining unchanged. A year ago the rate was 61.5 per cent; two years ago 39 per cent.

Youngstown, O. — Gain of 1 point to 93 per cent resulted from improved output at Republic Steel Corp.'s Warren, O., plant. Three bessemers and 70 open hearths are in operation.

Birmingham, Ala.—Steady at 94 per cent for the third week, with 22 open hearths active.

New England—Down 10 points to 90 per cent as one open hearth is withdrawn for repairs. The same rate is indicated for this week.

St. Louis—Dropping of one open hearth by an East Side mill caused production to lose 3 points to 77 per cent.

Central eastern seaboard—Up 4 points to 84 per cent.

Pittsburgh—Advance of 1 point to 94 per cent, with the same schedule for this week.

Wheeling—Unchanged at 93 per cent for the sixth consecutive week.

Buffalo—Drop of 3 points to 90 per cent resulted from three open hearths being taken off for repairs.

Chicago—Leveled off at 91 per cent.

Detroit — Continues at 100 per cent, operations being pushed at all plants.

Cleveland—Declined 2.5 points to 87.5 per cent. The reduction is only temporary, reflecting a shutdown for repairs.

Cincinnati—Off 3 points to 87 per cent, the curtailment being for open-hearth repairs.

U. S. Steel Shipments Increase 23.4 Per Cent

■ Shipments of finished steel by United States Steel Corp. subsidiaries in October totaled 1,218,545 tons, 23.4 per cent larger than 985,050 tons shipped in September. For ten months shipments totaled 8,076,972 tons, against 5,251,511 tons in the corresponding period in 1938.

■ Beehive coke production in October is reported by the bureau of mines as 253,800 net tons, compared with 75,200 tons in September and 60,700 tons in October, 1938. Ten months' production this year was 732,800 tons; in 1938 it was 695,100 tons.

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Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ HOW congress can help restore the nation's capital goods industries to a sound footing through federal tax revision was outlined last week to Treasury Undersecretary John W. Hanes by Machinery and Allied Products Institute of Chicago.

Statement was presented by William J. Kelly, Chicago, manufacturer and president of the institute, in response to Mr. Hanes' request for suggestions to be considered by the house tax committee now studying revision of the present federal tax system.

Pointing to the long period of severe losses suffered by manufacturers of capital goods since 1929, as compared with the relatively short deficit period experienced by consumer goods companies, Mr. Kelly asserted, "the revenue acts have dealt harshly with the capital goods industries. The very industries which have most needed relief and encouragement have been saddled with disproportionate tax burdens."

While consumer goods companies with their comparatively moderate recessions and more frequent upturns have been able in most cases to cope with the federal tax on net profits, he declared the tax burden on durable goods companies has been such as to frustrate new enterprise in the lines upon which America's technological progress is most dependent.

Longer Loss Carryover Urged

Mr. Kelly suggested the present two-year limitation on net loss carryover be revised more in line with that accorded industry in England, where since 1926 net loss carryover into six subsequent years has been provided.

"It is a fact of outstanding significance in the extended inactivity of the capital goods industries from 1930 to September of 1939," he said, "that the volume of transactions in securities has been greatly reduced. New domestic corporate securities issued during the decade of the 1920s, investment trust issues excluded, averaged 3.5 billion dollars a year, annual amounts varying from a low of 1.7 billions in 1921 to a high of 5.8 billions in 1929. In the seven years 1932 to 1938 inclusive, the average volume totaled only 0.6 billions, or about 17.5 per cent of the average annual volume shown for the decade of the twenties."

Effects of Capital Gains Tax

In the opinion of machinery and capital goods manufacturers, Mr. Kelly stated, the capital gains tax is responsible for:

1) The wide-spread postponement of taking of capital gains and an unwillingness to risk capital in pursuit of new gains, subjecting securities to wide fluctuations in prices as a result of "thin" markets;

2) Large and continuing shift to tax-exempt securities, with consequent reduction in supply of venturesome capital; and

3) Lack of favorable capital markets available to small, marginal and new enterprises.

These handicaps may be overcome, he suggested, if the capital gains tax be revised to a flat rate of 12.5 per cent; if full offset of capital losses be permitted without restriction or classification as to the length of time assets are held; and if capital losses in excess of capital gains are allowed to carry into any one of three succeeding years as a credit against capital gains.

In any tax revision plan congress must also take a more realistic recognition of the obsolescence factor in industrial maintenance, it was declared.

Estate taxes and surtaxes on higher bracket incomes also are hindering industrial progress, Mr. Kelly charged. "With death duties at their present height, instead of undertaking new ventures which would produce larger payrolls and more trade, estate owners and managers are forced to conserve such capital in shape to be immediately liquidated so that in event of death taxes may be paid without rendering the property insolvent. Individuals normally with means to undertake productive new enterprise must not only maintain a large proportion of their income in a high state of liquidity, but must weigh the prospective profit in new undertakings, less high surtax, against the stability, safety and liquidity of triple-A or tax-exempt securities."

Predicament of capital goods companies under the combination excess profit-capital stock tax has been especially severe, Mr. Kelly told Hanes. "In this lottery capital goods companies are required to name a figure to represent the declared value of their capital stock," he said. "If the declared value proves low in relation to profits, the excess profits tax is a punitive one. If the declared value is high and profits do not materialize the penalty is there none-the-less in form of a high capital stock tax."

Inequities inherent in the practice of using graduated rates of federal normal tax for corporations also brought criticism. Ending of the prohibition against consolidated tax returns for affiliated companies was a recommendation strongly emphasized by the institute.

O'MAHONEY OUTLINES TNEC WARTIME "PRICE PATROL"

Commodity prices again entered the limelight here when Senator O'Mahoney, chairman of temporary national economic committee, last week disclosed how his group will maintain the "price patrol" requested some time ago by the President.

Outlining the program at press conference, Senator O'Mahoney said TNEC will fully comply with Mr.

Roosevelt's wishes, announced hearings on the price situation are to be held the end of this month.

In answer to queries on steel prices he remarked, "Although quotations for structural steel and other steel products are unchanged for the last quarter, it is to be noted there has been a general withdrawal of former discounts and concessions."

Senator O'Mahoney pointed out the principal purpose of TNEC's price program is to provide a forum in which price movements under the unusual conditions now existing may be open to public surveillance. Committee has no authority to take legal action in connection with unjustified price boosts, but its power of inquiry will be exercised.

"The committee expects few instances of price rises without justification, and believes business will co-operate in analyzing situations where doubt may arise," Senator O'Mahoney stated. "We note with satisfaction that business leaders have already undertaken to prevent runaway prices.

"Movement of prices will be watched by the department of labor, which will also analyze special situations that may be brought to the committee's attention by complainants. If it develops that there has been unusual price movement, check will be made with the department of commerce to determine whether special inventory situations might account for rise. Thereupon, the situation will be discussed with the tariff commission, federal trade commission and the department of justice.

Will Air Price Complaints

"Memorandum may then be presented to TNEC for study as to whether it should request the federal trade commission or department of justice to make a field survey. Depending on results of such survey, public hearing would be called for airing of the complaint, and any interested person or group would be given an opportunity to justify the price increase.

"Committee will publish from time to time general analyses of prices. These reports will be for the purpose of advising both business and the consumer of the general situation with respect to commodities where price increases have occurred.

"Before specific hearings are held, the committee plans about the end of this month a general hearing to provide a foundation for future work and to inform the public of underlying characteristics of the current situation."

TRADE RECIPROCITY PACT SIGNED WITH VENEZUELA

Confirmation of a reciprocal trade agreement between United States and Venezuela, provisionally effective Dec. 16, increases to approximately 60 per cent the proportion of this nation's total foreign trade regulated by various reciprocity treaties.

Concessions obtained for American products include tariff reductions or maintenance of present schedules on iron and steel products, automotive parts and accessories, refrigerators, engines, radios, paints, pharmaceutical products, wheat flour, oatmeal, lard and lumber. In 1938 these items accounted for $19,000,000 out of $52,000,000 worth of exports to Venezuela.

Fifty per cent reduction on crude petroleum and fuel oil import duties was granted Venezuela. Continued free entry on fuel oil for ships, and on tropical or semitropical fruits was agreed upon. Treaty further provides imports into the United States of crude and fuel oils may not exceed 5 per cent of total crude processed in refineries here during preceding year.

JAPANESE STEELMAKERS FEAR EFFECTS OF EUROPE'S WAR

Japanese iron and steel circles fear the probable effects of a prolonged European war, according to a report from Donald W. Smith, assistant American commercial attache at Tokyo.

Japan is dependent to a considerable extent on iron ore brought from colonial possessions of the belligerent countries, on plant equipment from Germany, on imported special alloy steels required for its aircraft, automobile and machine tool industries.

Even in event Japan is able to maintain imports of ore from British India, British Malaya, French Indo-China and Australia, sharp rise in production costs is anticipated because of the upward trend of freight rates and insurance premiums. Another factor is admitted inadequacy of Japanese shipping to handle the volume of cargo under present conditions.

Uncertainty also is felt regarding future shipments from the United States, particularly after expiration of the commercial treaty between the two countries on Jan. 26, 1940. Prior to the war this matter was a cause for concern, and consideration was given to importing scrap iron from the United States through a third nation.

Government has attempted to meet conditions by ordering shipping companies to make compulsory allotments of vessels for importing scrap iron. Curtailing of deliveries of steel materials to private consumers also is reported.

Study of 1939 import figures for ores and metals clearly indicates Japan's great dependence on the United States and its possessions for raw and semifinished iron and steel products. During the past year, Japan's imports of ores and metals were valued at yen 661,894,000, of which only 12.7 per cent came from yen-bloc countries, 14.5 per cent from European countries, 26.2 per cent from the British dominions and colonial possessions and French colonial possessions, and 42.0 per cent from the United States, Hawaii, and the Philippine islands.

"PRIORITY" BODY SET UP TO ROUTE FOREIGN ARMS ORDERS

Establishment of a so-called "priority committee" to route foreign war orders so they will not interfere with domestic defense programs was revealed here last week. Committee was set up in June, but nothing was said about it until after neutrality act revision.

Organized by the joint army and navy munitions board, the body will play an important albeit unofficial role in suggesting the routing of more than $1,000,000,000 in foreign orders for warplanes and armament expected to come to American manufacturers. In this way, it was pointed out, the influx of foreign orders will not clog plants working on army and navy needs.

Including representatives of the state, treasury, and justice departments, committee is headed by Col. Charles Hines. By constant survey it keeps the munitions board informed on available industrial facilities.

GOVERNMENT IRON, STEEL PURCHASES TOTAL $11,155,674

During the week ended Oct. 28 the government purchased $11,155,674.26 worth of iron and steel products under the Walsh-Healey act as follows: Blaw-Knox Co., Pittsburgh, $15,760; Midvale Co., Philadelphia, $1,879,536.38; Baldwin Southwark Corp., Philadelphia, $34,009.24; United States Pipe & Foundry Co., Philadelphia, $10,807.90; Crucible Steel Co. of America, New York, $17,675; Bethlehem Steel Co., Bethlehem, Pa., $13,064.05; Duffin Iron Co., Chicago, $18,277; Henry Disston & Sons Inc., Philadelphia, $43,718.40; Bethlehem Steel Co., Bethlehem, Pa., $43,821.87; Newport Rolling Mill Co., Newport, Ky., $10,739.50; Lehigh Structural Steel Co., New York, $23,622; Nashville Bridge Co., Nashville, Tenn., $20,755; Jensen Byrd Co., Spokane, $10,445 (estimated); Budd Wheel Co., Detroit, $193,257.60; Standard Machinery Co., Providence, R. I., $19,303; Winchester Repeating Arms Co., New Haven, Conn., $8,700,000; Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., $68,122.32; and Charles Fischer Spring Co., Brooklyn, N. Y., $32,760.

AVIATION

BAN OFF, BUILDERS ACCEPT HUGE ORDERS FROM ALLIES

■ WARPLANE orders from the allies are pouring into America's aircraft plants in unprecedented volume. During the first few days after neutrality act revision lifted our arms embargo, Britain and France awarded to domestic builders contracts for planes and engines costing some $160,000,000. These boosted the industry's backlog to a new peak at approximately $475,000,000.

Bookings reported: United Aircraft Corp., East Hartford, Conn., Pratt & Whitney engines and Hamilton Standard propellers, $70,000,000; Curtiss-Wright Corp., New York, pursuit ships and Wright Whirlwind motors, $50,000,000; Douglas Aircraft Corp., Santa Monica, Calif., attack bombers, $30,000,000; Lockheed Aircraft Corp., Burbank, Calif., reconnaissance bombers, $5,000,000; and Republic Aircraft Corp., Farmingdale, L. I., pursuits, $4,000,000.

Aggregating an estimated 3000 planes, these awards are expected to be supplemented in the near future by orders for an additional 4000. When the embargo was declared Sept. 6 shipment was banned for 880 units then uncompleted under allied orders for 1490 planes. Production was continued on these and delivery now is being rushed. Britain and France, it is believed, may supply pilots to ferry completed ships across the Atlantic.

Require New Training Planes

Training craft are urgently needed, and North American Aviation Inc., Inglewood, Calif., is considered in line for a $20,000,000 contract to furnish more than 1000 such ships. Unquestionably, allied buying in the case of fighting machines has received stimulus from official reports that during action on the western front American combat planes displayed great superiority over German units.

All contracts, of course, are being closed on a cash-and-carry basis, with liberal advance payments required, and provision made to protect builders on unfinished planes should hostilities end before orders are filled. With informal federal assent, manufacturers are increasing export prices sufficiently to cover plant expansions necessitated by their foreign business.

Federal equipment orders received last week: From civil aeronautics authority, Federal Telegraph Co., Newark, N. J., radio equipment, $311,906; from the navy, Lockheed Aircraft, planes, $117,668; and Pioneer Instrument division of Bendix Aviation Corp., Bendix, N. J., indicators, $51,760; from army air corps, BG Corp., New York, spark plugs, $37,250.

United Airlines, Chicago, last week signed a contract with Douglas Aircraft for ten four-engined 40-passenger DC-4 transport ships costing approximately $340,000 each, to be delivered in spring of 1941. This replaces a previous order for six larger DC-4s costing $500,000 each.

General contract has been let by United Aircraft Corp. in construction of a new production unit and powerhouse costing a total of $1,000,000 for its Pratt & Whitney division, East Hartford, Conn. Vultee Aircraft division of Aviation Mfg. Corp., Downey, Calif., recently awarded contracts for a $45,000 factory extension, soon will take bids on another project costing over $75,000 with equipment. Three one-story assembly plant additions costing in all nearly $250,000 are to be started at Buffalo this month by Curtiss-Wright's Curtiss Aeroplane division.

Capital Issues Planned

Negotiations have been concluded by Boeing Aircraft Co., Seattle, with several banks and the Reconstruction Finance Corp. for a $5,500,000 five-year loan to augment its working capital. Aeronautical Corp. of America, Cincinnati, announces it soon will market new common stock whose proceeds will be employed to double the firm's capacity.

Perfection of a secret new electric device co-ordinating the army's bomb-sight and the Sperry automatic pilot is said to have greatly increased bombing effectiveness, cutting in half the time formerly required to aim and release a cargo of explosives. Air corps bombers so equipped are reported to score direct hits at altitudes above 25,000 feet, lessening the need for dangerous dive bombing.

Doubled power is seen for air-cooled aircraft engines in a new finning system just announced by National Advisory Committee for Aeronautics. Developed by NACA after eight years of research at Langley field, Va., laboratories, it calls for changes in the size and spacing of cylinder cooling fins, uses new alloys to dissipate heat.

1939 Scrap Yearbook Issued by Institute

■ Institute of Scrap Iron and Steel Inc., New York, has issued a yearbook for 1939, first of an annual series, edited by Edwin C. Barringer, executive secretary.

Considering that statistics of the industry are difficult to obtain, an excellent presentation is made.

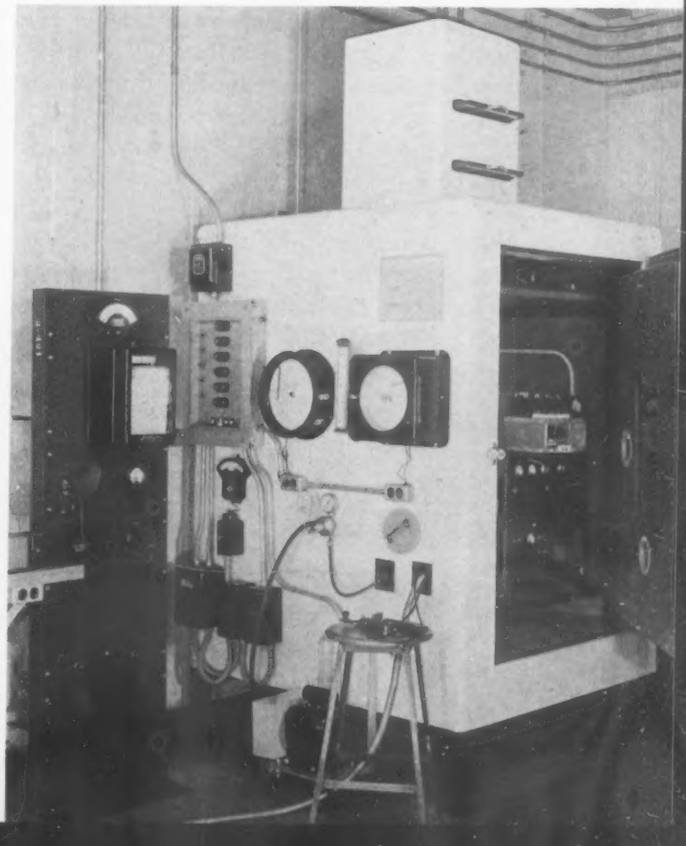
"A Primer on Scrap"—leading chapter—presents a general view of the process of gathering, reclaiming and using scrap, how and why it is used, sources of supply and the role of the dealer and broker.

Various tables and charts cover vital statistics of the scrap industry, consumption, price of representative grades, exports, world trade and other data. Specifications by the department of commerce and the Association of American Railroads, the code of fair trade practice, are presented in full.

The book also contains a list of officers, committee chairmen, active members of the institute, and operators of scrap baling presses. Nonmembers may obtain copies at $1 each from the institute, 11 West Forty-second street, New York.

Aircraft Radio Testing Unit

■ **Combination ice-box and furnace is this steel chamber devised by Bendix Radio Corp., Baltimore, for testing airplane radio equipment under service conditions. Equipped with electric heaters, dry ice pans, vaporizers and circulating fans, the chamber may be warmed to + 75 degrees Cent. or cooled to — 50 degrees Cent. at any desired humidity. Precision controls and indicators enable minute variations**



BOTH LIGHT AND TIGHT

By no means least among the advantages of modern materials is the opportunity they afford the designer of matching more closely the service requirements of the job.

For example, Carbon-Molybdenum steel effectively meets the necessities of oil refining reaction chambers where temperatures are not over 1000 degrees F. and corrosion is not a factor.

First, its creep strength is so much superior to that of carbon steel that sections can be greatly reduced—resulting in a weight saving of approximately 40 per cent.

Second, it is readily weldable—so sound, pressure-tight joints can easily be made.

The net result is that Carbon-Molybdenum steel proves an ideal material for the construction of comparatively inexpensive, yet efficient and long lived vessels — when requirements are within the limits stated.

To assist you in checking your own material specifications we have prepared an authoritative technical booklet, "Molybdenum in Steel", which is sent free on request to interested production executives and engineers.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

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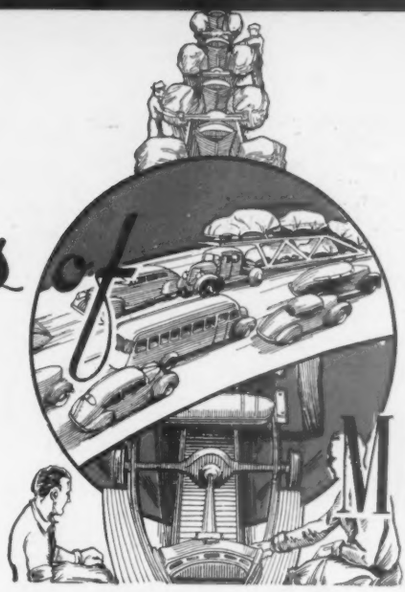
MOLY

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ MAYORALTY election stole the spotlight here last week, as the incumbent, Richard W. Reading, swept into office two years ago on a wave of anti-CIO votes, was unseated in no uncertain fashion by former council-president Edward J. Jeffries Jr. The new 39-year old mayor is the son of the late Judge Jeffries who was a political figure locally for several decades and whose pet peeve was the police department and pet friend the commoner. His son apparently inherits this peeve, having stated on numerous occasions he plans some changes in administration of police activity which here, as in many another large city, is a favorite political football.

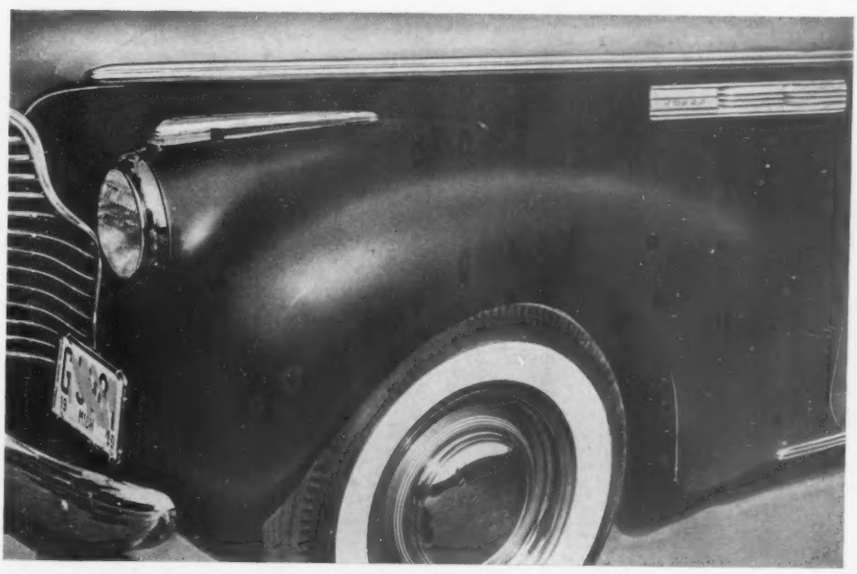
Mayor Reading throughout his campaign for re-election charged his opponent with CIO and communist affiliations and by his continual harping on this theme put up rather a weak campaign fight. Jeffries unquestionably is a liberal but his actual tieup with the CIO or communistic elements is doubtful and it is believed unlikely he will do anything like turning over the city administration to radical labor powers. An official high in the ranks of one of the motor companies here who has an intimate knowledge of things political told a friend his organization considered Jeffries "harmless" and likely to give business and industry in Detroit a fair deal.

Many took the one-sided vote—226,185 to 108,973—to indicate a swing in public sentiment toward labor unions, but a more correct analysis would be that it indicates favor accorded a brilliant young lawyer with a name having "political punch," over a rather stolid, drab older man whose two years in office have produced nothing exceptional in the way of administration, nothing to capture the fancy of this city's voters who must always have a champion or at least a runner-up to worship. The level of the campaign can be judged from the fact one of Jeffries' main charges against his opponent was that he had 35 relatives on the city payroll.

Naturally the coincidence of the Chrysler strike and the election provided fodder for anti-CIO commentators, their effect being negligible. Meanwhile prospects appeared a little brighter for settlement of the month-old tieup which is daily costing Chrysler and its employes millions of dollars. Resumption of operations by this week seemed possible. The UAW charged the corporation with engineering a back-to-work movement among idle employes. Obviously the corporation is making a last-ditch stand and when a settlement is reached it will probably be the usual thing of a few minor concessions granted to the union but no sacrifice of major labor policies by Chrysler.

A humorous angle was injected by the picketing of a picket line by a housewife who was getting weary of having her son and brother out of work. She painted a few signs and marched around a Dodge picket line for a few minutes before being "escorted" away by union leaders, later to nurse some bruised fingers and announce plans for a mass

One Steel Sheet Does Triple Duty



■ **Dark portion in this illustration shows the three-in-one steel stamping developed for Buick models, comprising fender and shroud, hood side and headlamp shell. It is formed from a single steel sheet 5 x 8 feet and is probably one of the most unusual and difficult automotive stampings ever attempted**

meeting of women who were opposed to continuation of the strike. Promptly a second group of women took up places on the picket line, disavowing any sympathy with the first woman's sentiments. Inconsequential incidents, these trivialities often have a way of developing into major movements. The power of the housewife in swaying emotions of workmen usually is forgotten or underestimated anyway, and empty larders may speak more forcibly than union shop stewards.

■ REPORTS of steel shortages developing in this territory are scoffed at by suppliers here who state that motor plants and allied industries are well taken care of as far as steel is concerned—too much so, if anything. For example, Chrysler came into the steel market with a rush about two months ago and sought to cover on requirements well into next spring. After the strike tied up plant operations, shipments were held up in some cases while a large quantity of material was taken in and had to be stored, some of it in the open. It is rumored the former Dodge truck plant has been used as storage space for steel, and observers have noted sizable amounts of steel stored along railroad sidings in Highland Park.

Briggs, throttled in supplying Chrysler bodies by the strike, has rented a vacant plant belonging to American Car & Foundry Co. here and is using it to store steel until operations can be resumed.

The feeling is becoming more pronounced here that industry was overoptimistic in its buying policies after declaration of war in Europe in September, that hoped-for South American and foreign buying has not developed to anywhere near expected proportions, that entirely too much buying for inventory has appeared, that a reaction is inevitable. This bearish sentiment is reflected in current stock market trends and in the failure of any noticeable improvement to develop following repeal of the arms embargo. One steel company official here points out that October ingot production exceeded that of May, 1929, peak month for that year, while the level of steel consumption is considerably below that of ten years ago. With probably 95 per cent of this output going into domestic channels, there is little chance of any steel shortage developing.

Consumers universally profess interest in what first quarter prices on steel are going to be, some having placed business for first-quarter shipment regardless of price. While an advance of $2 or $3 has been tipped off, it would not surprise some observers to see steel prices reaffirmed on the present basis. Current levels are decidedly firm, which means in effect an $8 increase on many automotive accounts. Steel production holds at high levels, good earnings for the last quarter are inevitable, and there is the further pressure of the monopoly investigations in Washington to be considered.

At the same time it should be kept in mind that raw material prices have advanced to near the levels of early 1937. Scrap, for example is within $2 or $3 of the peak two years ago. Pig iron is $1 under the 1937 level. Steel prices, on the other hand, are well below those prevailing in April, 1937. Compared with prices at that time, hot-rolled sheets are now $8 a ton less expensive, cold-rolled sheets $10 per ton, bars $6 per ton, and hot-rolled strip $3 per ton. Thus steelmakers are faced with a $5-6 "squeeze" on the basis of present quotations.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
Aug.	405,072	96,946	103,343
Sept.	175,630	89,623	192,672
9 mos.	3,954,480	1,642,520	2,570,161
Oct.	337,979	215,286	.....
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Oct. 14	75,860	43,540
Oct. 21	70,114	59,860
Oct. 28	78,210	65,335
Nov. 4	82,690	75,830
Nov. 11	86,200	*86,094

†Comparable week.

	Week Ended Nov. 11	Nov. 4
General Motors	47,630	44,105
Chrysler	.....	960
Ford	22,600	21,825
All others	15,970	15,800

*Revised.

■ MACHINE TOOL sales offices report little interest as yet by automotive companies in acquiring new tools for 1941 model work which should be under way in two or three months. They are inclined to the opinion few changes are being planned in next year's jobs, principally because 1940 models are being received so favorably by the buying public. Tool builders are so swamped with foreign orders, however, they are not seriously concerned over failure of automotive activity to materialize.

Some of these builders have two separate "delivery" lists—one for domestic and one for foreign inquiries. Where a foreign buyer might be quoted 50 weeks delivery on a standard machine, a domestic purchaser will be quoted 15-18 weeks on the same equipment. In extending delivery dates on foreign orders, builders are able to protect themselves against the eventuality of such business going astray, by the expedient of quoting shorter delivery dates on domestic orders.

General Motors diesel division here is reported to have purchased some new machine equipment for expanding production of 2-cylinder engines. This division of GM, here and in La Grange, Ill., and Cleveland, is said to be booked solidly, and a further expansion of plant facilities at La Grange is up for consideration.

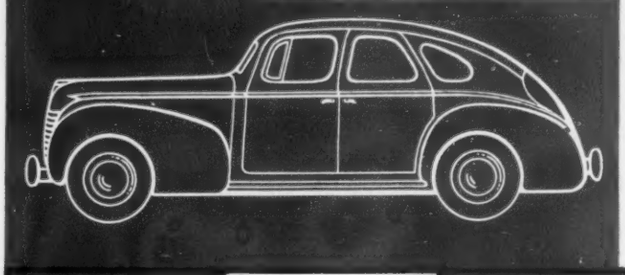
Custom bodies for the Packard line, styled by a Parisian expert, are being supplied from the old Auburn plant in Connersville, Ind., and reports indicate improved demand for these ornate jobs which bring around $5000 apiece. The bodies require a large amount of hand work by so-called "sculptors in solder" and naturally they are not turned out in any great quantity.

6-Cylinder Ford Unlikely

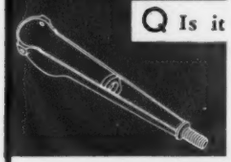
Classified as purely experimental, with only a remote chance of ever seeing the production line, is a new version of a low-priced Ford model, with 6-cylinder valve-in-head engine, mounted on a smaller and lighter body-and-chassis combination with about 100-inch wheelbase. While experimental work on new models is nothing new in any of the motor companies, the interesting angle is that Ford engineers would consider a 6-cylinder valve-in-head engine. It is almost inconceivable Mr. Ford himself could be sold on such a job. He has held the opinion a six is a "motor and a half" and not ideally suited to his production facilities.

Literature on the Graham lines for 1940 shows the two new models sporting the former Hupp Skylark body and identified as the Clipper and the Hollywood, identical except for one having supercharged engine. It does not appear to have been settled definitely whether or when Graham will start production on these new models. Die changes, new dies, acquisition of steel tonnage and determination of the part the Hupp organization will play in the picture are a few of the obstacles in the path to supplying cars to dealers.

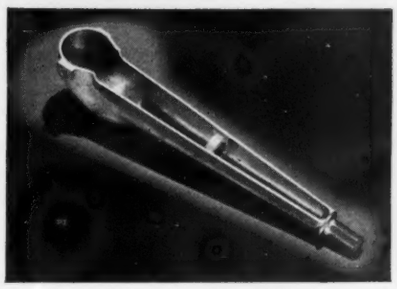
WHY DOES DETROIT PREFER DIE CASTINGS?



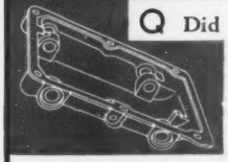
—A *Quiz*



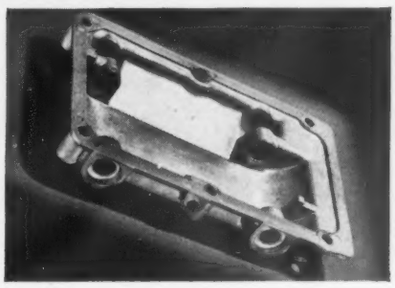
Q Is it possible to solve both appearance and mechanical problems with die castings?



A The all-important requirement of this 1940 gear shift lever is strength. As a one-piece ZINC Alloy Die Casting this quality is easily achieved — and smooth appearance couples with low cost to make die casting the ideal method of production.

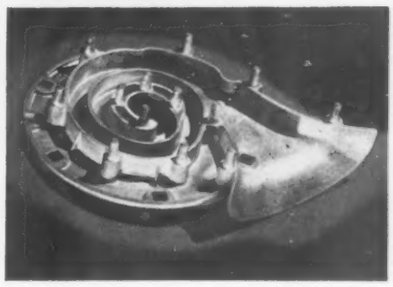


Q Did ZINC Alloy Die Castings have any influence on the design of the latest type transmission case?

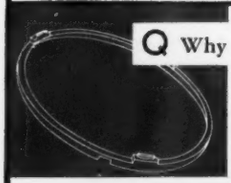


A It is highly improbable that the design of this transmission cover could have been carried out by any means other than die casting. With the usual production method, machining costs would be exorbitant.

Q Why are horns back as die castings in '40?



A This is a question of arithmetic. With quality being more or less equal, the choice of material for horn construction narrows down to price. The illustrated horn part for '40 cars has a ZINC Alloy Die Cast body.



Q Why is this seal ring on new sealed beam headlights a ZINC Alloy Die Casting?

A Note the 3 integrally cast locating lugs and the knife edge on this die cast ring. The lugs facilitate assembly and the edge is spun to effect sealing. By no other method could this part have been economically produced—in one piece.

The 1940 automotive die castings reveal a flexibility of design that places this method of metal parts production in a class by itself. And this is only one industry in which ZINC Alloy Die Castings are enjoying wide application. Whether your company produces automobiles or home appliances or dime banks, you should be well versed in this modern metal and method of fabrication. Consult any commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York City.

ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are made with

HORSE HEAD SPECIAL (99.99+% Uniform Quality) ZINC

September Steel Imports Heavier

■ IRON and steel imports into the United States during September, excluding scrap, totaled 26,658 gross tons valued at $1,431,318, compared with 24,599 tons valued at $1,354,288 in August, and 23,739 tons valued at $1,332,011 in September, 1938, according to the metals and minerals division, bureau of foreign and domestic commerce.

Canada was the largest source of supply, 9931 tons, mainly spiegeleisen, 8349 tons, and pig iron, 1471 tons. Belgium shipped 5371 tons, including 1723 tons of shapes, 1106 tons of hoops and bands and 957 tons of bars. Norway contributed 3674 tons, of which 3659 tons was ferromanganese. British India's trade was all pig iron, 2700 tons.

Scrap shipments, 3216 tons valued at $27,314, were slightly below 3729 tons valued at $32,564 imported in August. For nine months scrap imports totaled 25,083 tons valued at $249,041, compared with 7659 tons valued at $95,339 in the 1938 period.

Imports other than scrap for nine months this year were 240,964 tons valued at $14,222,744, against 174,052 tons valued at $10,891,844 for nine months last year.

U. S. FOREIGN TRADE IN IRON AND STEEL, INCLUDING SCRAP

Gross Tons

	1939 Exports	1939 Imports	1938 Exports	1938 Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	359,690	19,149	460,640	19,589
March	474,360	25,369	526,883	11,827
April	394,008	44,083	489,202	21,237
May	532,641	28,142	540,639	20,814
June	588,856	32,587	312,021	15,887
July	513,664	30,851	263,699	14,728
Aug.	477,078	28,328	242,139	20,041
Sept.	575,613	29,874	346,068	27,958
Oct.	.....	.....	425,431	26,445
Nov.	.....	.....	469,596	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

ORIGIN OF SEPTEMBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	7,828	.....	.....	3,659
Sweden	7,786	.....	.....	.....
Canada	7,098	1,471	.....	.....
Cuba	21,000	.....	2,575	.....
Chile	135,350	.....	.....	.....
Mexico	89	.....	.....	.....
Brazil	.....	5	5,629	.....
British India	.....	2,700	12,168	.....
Soviet Russia	.....	.....	10,063	.....
Gold Coast	.....	.....	12,299	.....
France	.....	.....	.....	43
Total	179,151	4,176	42,734	3,702

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	71	1,723	957	1,106
United Kingdom	1	.....	12	.....
Canada	4	.....	1	.....
Sweden	4	.....	114	.....
France	.....	204	157	161
Germany	.....	9	.....	9
Total	80	1,936	1,241	1,276

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Sept. 1939	Aug. 1939	Jan. thru Sept. 1939
Pig iron	4,176	3,204	29,423
Sponge iron	53	244	1,275
Ferromanganese (1)	3,702	2,355	26,550
Spiegeleisen	8,349	1,007	27,198
Ferrochrome (2)	18	.....	129
Ferrosilicon (3)	142	93	1,109
Other ferroalloys (4)	12	38	212
Steel ingots, blooms, etc.	.....	7	11
Billets, solid or hollow	14	29	268
Concrete reinforc. bars	20	330	2,350
Hollow bar and drill steel	107	129	1,078
Bars, solid or hollow	1,241	2,163	15,264
Iron slabs	.....	.....	.....
Iron bars	143	34	578
Wire rods	1,052	775	7,565
Boiler and other plate (including skelp)	2	1	23
Sheets, skelp, saw plate	80	22	1,378
Die blocks or blanks, etc.	.....	.....	80
Tin plate, taggers' tin and terneplate	9	5	51
Structural shapes	1,936	4,770	37,448
Sashes and frames	.....	.....	5
Sheet piling	.....	.....	462
Rails and track material	85	222	4,805
Cast-iron pipe and ftgs.	782	295	1,478
Mall. iron pipe fittings	3	4	115
Welded pipe	117	363	4,380
Other pipe	220	441	25,038
Cotton ties	804	2,939	7,126
Other hoops and bands	1,276	2,010	15,732
Barbed wire	1,159	1,621	14,650
Round iron and steel wire	185	209	1,789
Teleg and telephone wire	..	5	7
Flat wire and steel strips	202	309	2,319
Wire rope and strand	74	113	1,383
Other wire	109	103	1,410
Nails, tacks, and staples	549	614	6,904
Bolts, nuts, and rivets	7	13	86
Horse and mule shoes	17	62	324
Castings and forgings	13	70	961
Total	26,658	24,599	240,964
Iron and steel scrap	3,216	3,729	25,083
GRAND TOTAL	29,874	28,328	266,047

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

Britain Puts Machinery Imports Under License

■ Great Britain has issued import prohibition No. 4, effective Oct. 24, requiring import licenses for all classes of industrial and agricultural machinery, plant appliances and parts, componenta and accessories, including tractors, but excluding airplanes, locomotives and vehicles other than tractors. Import licenses for machine tools will be issued only to importers on approved list.

The following items of electrical equipment are also subject to import licenses: Battery-charging sets, condensers, converters and transformers, electric heating and cooking apparatus, electromedical apparatus, generators and parts, magnetos, meters, motors and parts, electrically-driven portable mechanical appliances, starting and controlling gear and parts therefor, telegraph and telephone apparatus.

Machinery division, department of commerce, warns American manufacturers that a license must be assured before accepting orders.

Activities of Steel Users, Makers

■ SYMINGTON - GOULD CORP., Rochester, N. Y., announces dissolution of its wholly-owned subsidiary, Gould Coupler Corp., and will carry on the business and operate the Gould Coupler works at Depew in conjunction with the works at Rochester.

♦

Koppers Rheolaveur Co., Pittsburgh, has been awarded contract for approximately $160,000 by the Koppers Coal Co. to provide the first unit of a coal washing plant at the company's new mine in Koppersston, W. Va.

♦

Plant expansion at Indiana Harbor, Ind., works of Youngstown Sheet & Tube Co. is expected to be completed Jan. 1. Plant capacity will be increased about 18 per cent by the $17,500,000 expenditure, which will include one new open hearth, a 46-inch blooming mill, and new boiler and power equipment. A new continuous butt-weld pipe mill is planned for installation in 1940.

♦

Allen-Bradley Co., Milwaukee, manufacturer of electric motor controls, has appointed the following new factory representatives: Paul Berry, 3128 Northwest Twenty-sixth street, Oklahoma City, Okla., for Oklahoma and Arkansas, and A. V. Sorensen, operating as the Midwest Equipment Co., 1206 Farnam street, Omaha, Nebr., for Nebraska and western Iowa.

♦

Armco Culvert Manufacturers' association, Middletown, O., has adopted the name of Armco Drainage Products association, due to a change in the trend of its business from strictly culvert pipe to that of culverts, sewers, storm drains, small bridges and allied products.

♦

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has booked an order from Florida Power & Light Co. for a 25,000-kilowatt turbine generator to be installed in its Lauderdale steam-electric station at Dania, Fla.

♦

Roller Smith Co., Bethlehem, Pa., has appointed the following sales agents: Walter V. Gearhart Co., Atlanta, Ga., covering Georgia, North and South Carolina and parts of Alabama and Florida; Public Service Supply Co. Inc., Midland building, Cleveland, northern and southeastern Ohio; J. J. Thalheimer, 242 Fountain avenue, Dayton, O., southern Ohio, southern Indiana and Kentucky.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ WHEELING STEEL CORP., Wheeling, W. Va., has announced an expansion program to increase its sheetmaking facilities. The initial step is the widening of present hot mill facilities at Steubenville to 66 inches and increasing speeds to 1900 feet from the present 1200-foot rate. Additional jobs include several new cold mills at Steubenville and Yorkville plants, further shear lines and straighteners at the Yorkville plant. Skin pass equipment will be revamped to provide twin skin pass mills there.

At Steubenville a 4-stand tandem 54-inch cold mill will be installed and existing equipment will be widened to 54 inches. The entire program is expected to be completed by June, 1940.

♦

Plant Expansions Scheduled

New industrial expansion plans in this district include a plant to be erected by Vulcan Detinning Co., adjoining its present works on Neville island. New unit will cost $125,000 and will house new equipment, designed to increase efficiency of company's chemical detinning process. Installation will require six months.

Koppers Co., engineering and construction division, has announced Algoma Steel Corp. Ltd. has awarded it a contract for constructing light oil refining plant at Sault Ste. Marie, Ont.

Vanadium Alloys Steel Co., Latrobe, Pa., has settled its litigation with Philip McKenna with regard to the McKenna patents on cemented carbide tool compositions. Terms of the settlement were not announced, although it was stated Mr. McKenna has been licensed to continue in the manufacture and sale of cemented hard carbide compositions under the name of McKenna Metals Co. This company has been producing cemented carbide tools.

River commerce is increasing, and it is possible current tonnages will pass the all-time highs set in 1937. Orders have been placed with local firms for additions to river fleets. Among the most recent is a 1300-horsepower twin-screw diesel towboat to be built by Dravo Corp. for its subsidiary, Union Barge Line. The barge line has also ordered four welded steel hopper barges, 175 feet overall, and recently has taken delivery on two new liquid-carrying units.

American Bridge Co. has been awarded a contract by Socony-Vacuum Oil Co. for construction of six new oil carriers, 195 feet overall. These units will require about 1500 tons of steel.

Sutton Engineering Co. has announced sale of nine new straighteners, including three pipe straighteners for this district and one shape and flat straightener for export to Russia.

♦

Raise Wage Issue

Labor unit at Donora, Pa., zinc works of American Steel & Wire Co. is demanding a wage increase, based on rate paid by American Zinc & Chemical Co., at nearby Langeloth, Pa. Langeloth workers are members of the Mine, Mill and Smelters' affiliate of the CIO, while the Donora workers are operating under the SWOC contract held by United States Steel Corp. subsidiaries.

In the Donora plant are several thousand workers outside the zinc works. All are paid on the same basis, including a $5 minimum day. The Langeloth union has a $5.50 minimum, which is the demand now made by the Donora group.

SWOC national headquarters here has declared the affair "purely a local matter," and has indicated the action will be carried on by only the local lodge, and not the national office.

Increasing zinc workers' base pay, while leaving other members of the union on the present base, would create internal friction in the plant. If, in order to avoid trouble at Donora, the base for all workers is raised, unrest in all steel plants here, as well as other plants might result. Strike vote was taken by the SWOC local last Monday, and the walkout was slated for last Friday.

♦

Payrolls Reflecting Upturn

Employers' association of Pittsburgh announces the upturn in industry has been reflected in its September labor summary. Totals from the 63 firms reporting show 36,180 on September payrolls against 35,543 in August. Significant also is the increase in average work week, up to 40.4 hours from 39 hours. This indicates overtime pay for many workers, nearly all plants having 40-hour contracts. New hiring amounted to 1021 men in September against 654 in August. Preliminary figures compiled by the association indicate the full force of the increase will be shown in the October reports.

MEETINGS

NATIONAL FOUNDERS WILL HEAR PROMINENT SPEAKERS

■ A LIST of well-known speakers headlined by Millard E. Tydings, United States senator from Maryland, Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt.; John C. Gall, counsel, National Association of Manufacturers, New York; and W. B. Stout, president, Stout Engineering Laboratories, Dearborn, Mich., will feature the forty-third annual convention of the National Founders' association, Waldorf-Astoria hotel, New York, Nov. 15-16.

Mr. Flanders will speak on "Unemployment as a Long-Range Problem"; Mr. Gall on "Federal Legislative Trends"; and Mr. Stout on "The Second Coming of Aviation." F. R. Hoadley, president, Atwood Machine Co., Stonington, Conn., and president of the association, will discuss "Business as Usual" in his address.

Brig. Gen. Henry J. Reilly, officers reserve corps, will deal with "What Europe Needs from Us"; and Col. F. H. Miles Jr., commandant of the army industrial college, will discuss "Industrial Mobilization."

At the final session of the meeting, Gregory J. Comstock, metallurgical consultant, New York, will speak on "Powdered Metallurgy"; and Eugene J. Benge, management engineer, Chicago, will consider "Job Evaluation: Is It Adaptable to the Foundry?"

1940 SAFETY CONGRESS RETURNING TO CHICAGO

The 1940 National Safety congress and exposition will be held in Chicago, Oct. 7-11, with headquarters in Stevens hotel. This will be the twenty-ninth congress sponsored by the National Safety council and the seventh in Chicago, the last one in this city in 1938. The program will feature 140 sessions and 500 speakers on every phase of accident prevention.

OHIO STEEL EXECUTIVES TO HEAR GIRDLER SPEAK

Tom M. Girdler, chairman, Republic Steel Corp., Cleveland, will be principal speaker at a Steelmakers' dinner of the Cleveland chamber of commerce, Hotel Cleveland, Cleveland, Nov. 14. Executives of Ohio companies engaged in the manufacture and fabrication of steel have been invited.

■ Purchasing Agents Association of Chicago will hold its eleventh annual products exposition at Sherman hotel, Chicago, Nov. 15-16.

MEN OF INDUSTRY

■ FRANK S. QUICK, James L. Black, Irving J. Morris and William A. Dissosway, veteran employes of Allegheny Ludlum Steel Corp., whose combined service totaled 137 years, upon their retirement recently were feted at the Fort Orange club, Albany, N. Y., and each was presented with a gold watch.

Mr. Quick, purchasing agent since 1912, and Mr. Black, for many years in charge of the melting and alloy department, were with the original company at Pompton Lakes, N. J., moving to Watervliet, N. Y., in 1907, when the company built its first mill there. Mr. Morris, assistant treasurer, was with the company 21 years, and Mr. Dissosway, paymaster, since 1918.

♦

John M. Lutz has become associated with the Chicago sales division of Continental Roll & Steel Foundry Co., East Chicago, Ind.

♦

K. E. Meneke, engaged in sales work for Filtration Engineers Inc., Newark, N. J., has resigned to become sales engineer, Lancaster Iron Works Inc., Hackensack, N. J.

♦

Clark H. Minor, since 1925 president, International General Electric Co., New York, has been elected a director, General Electric Co., Schenectady, N. Y.

♦

Edward Mack Jr., former head of the department of chemistry, University of North Carolina, has been added to the supervisory staff of Battelle Memorial institute, Columbus, O.

♦

Lewis H. Brown, president, Johns-Manville Corp., New York, has been awarded the Vermilye medal by the Franklin institute, Philadelphia, "in recognition of outstanding contribution in the field of industrial management." Presentation will be made in Philadelphia, Nov. 14.

♦

Dewey E. Godfrey, Dallas, assistant manager in the Texas district for Remington Arms Co., has been promoted to district sales manager, succeeding J. W. Speight, retired.

♦

Joseph G. Jackson and Louis Alton have been named vice presidents, Edward Katzinger Co., Chicago. Mr. Jackson will be in charge of manufacturing, while Mr. Alton will have charge of purchases.

♦

W. E. Caldwell, manager of sales, Cleveland Twist Drill Co., Cleveland, has been elected president, Metal Cutting institute. He succeeds W. B. McSkimmon, president, Union Twist Drill Co., who has held that post the past five years.

♦

Dr. Robert M. Dickey, head of the department of geology and mineralogy, Michigan College of Mining and Technology, Houghton, Mich., since 1936, has resigned to become sales engineer, Bucyrus-Erie Co., South Milwaukee, Wis.

♦

W. D. Creider has resigned as general manager, Oilgear Co., Milwaukee, which position he held 11 years. Prior to that he was sales manager for six years. Mr. Creider has been associated with the machine tool industry the past 25 years.

♦

As reported in STEEL, Nov. 6, page 41, John F. McComb has been named sales manager, merchants trade sheet division, Continental Steel Corp., Kokomo, Ind.; A. C. Huber has been appointed sales manager, manufacturers' sheet division; Hoyt Shepard has become assistant to the general sales manager, sheet division, and W. Paul Irwin continues as sales manager, Superior Sheet Steel Co., Canton, O., a Continental subsidiary.

♦

George C. Gress, assistant manager of sales in charge of the molding compound department, plastic division, Monsanto Chemical Co., Springfield, Mass., now heads the general branch office in Detroit for that division.

♦

Franz A. Kartak, dean, Marquette university, college of engineering, has been elected president, Engineers' Society of Milwaukee. E. F. Vilter has been chosen vice president, and W. R. Mueller, re-elected secretary-treasurer.

♦

Edward J. Greene has been named assistant treasurer, Chain Belt Co., Milwaukee. He formerly was assistant treasurer and purchasing agent, Baldwin-Duckworth Chain Corp., Springfield, Mass., which recently was merged with Chain Belt.

♦

Frank F. Bonnevier, formerly with Allegheny Ludlum Steel Corp., and Buffalo Stainless Steel Foundry, has joined the supervisory staff of Cooper Alloy Foundry Co., Elizabeth, N. J. C. T. Coffman also has joined the Cooper company. He formerly was with Packard Motor Car Co., Detroit.

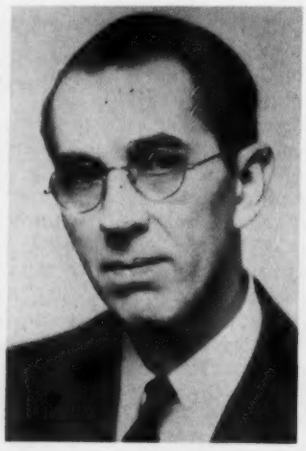
♦

Prof. Arthur M. Greene Jr., dean of the school of engineering, Princeton university, since 1921, will retire in June and will be succeeded by Kenneth H. Condit, at present executive assistant to the president, National Industrial Conference board, New York.

♦

Prof. George Erle Beggs, of Princeton university, has been elected chairman, Engineering Foundation, New York, research organization of the national engineering societies. O. E. Buckley, executive vice president, Bell Telephone Lab-

John F. McComb



A. C. Huber

W. Paul Irwin

Hoyt Shepard

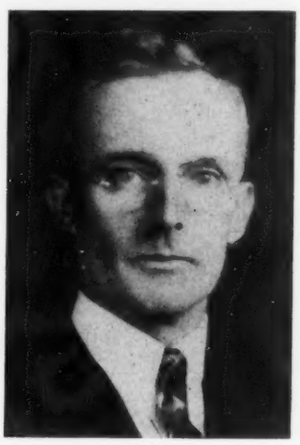
oratories, New York, has been chosen vice president; Otis E. Hovey, re-elected director, and John H. R. Arms, secretary.

♦

R. O. Watson has been made sales manager, transportation and generator division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He succeeds Max Kennedy, who has been assigned to sales activities in the Middle Atlantic district. The past two years he was manager, generator sales department. He is a member, National Electrical Manufacturers association and is an associate member, Association of Iron, Steel and Electrical Engineers.

♦

Frank R. Burnette has been appointed construction superintendent, and Howard L. Dawson, engineer of repairs, maintenance and lubrication, Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Burnette formerly was



Frank R. Burnette

assistant chief engineer, American Steel & Wire Co., Cleveland, and Mr. Dawson was maintenance superintendent, Edgar Thomson works of Carnegie-Illinois.

♦

G. M. Fletcher, Stanley Works, New Britain, Conn.; T. V. Busk, Farrel-Birmingham Co., Ansonia, Conn.; D. M. Davidson, Fafnir Bearing Co., New Britain, Conn., and G. P. Lonergan, Bristol Co., Waterbury, Conn., have been elected directors, Industrial Advertising and Marketing Council of Connecticut and Western Massachusetts.

♦

W. H. Armacost has been placed in charge of engineering development in the marine department, Combustion Engineering Co., New York, in addition to his duties in connection with stationary equipment. H. S. Colby, the past five years general sales manager of the company, has been delegated with

Frederick J. Griffiths

Who has been appointed executive vice president, Copperweld Steel Co., in charge of the newly created alloy steel division, Warren, O., as reported in STEEL, Nov. 6, page 40

executive responsibility for the company's marine business. Donald S. Walker, formerly manager, Philadelphia district, has been appointed general sales manager. He will be assisted by Otto deLorenzi and H. G. Ebdon, as assistant general sales managers.

DIED:

■ A. L. HUMPHREY, 79, Nov. 1 at his home in Pittsburgh. Retired president and board chairman, Westinghouse Air Brake Co., he had been chairman of the executive committee since 1936. After many years' railroad experience, he was made president in 1919, and succeeded H. H. Westinghouse as chairman in 1933. He also was executive director, Union Switch & Signal Co., an affiliated company; director, First National bank at Pittsburgh, and director of other Westinghouse companies. He was a member, American Society of Mechanical Engineers and Engineers' Society of Western Pennsylvania.

♦

John Nicol, general foundry superintendent, Sibley Machine & Foundry Corp., South Bend, Ind., Oct. 16.

♦

R. W. Busse, 61, president, Optenberg Iron Works, Sheboygan, Wis., in that city, Oct. 24.

♦

H. P. Preis, 50, president, H. P. Preis Engraving Machine Co., Newark, N. J., in that city, Nov. 2.

♦

John C. Henry, 81, at his home in Cleveland Heights, O., Nov. 7. Before retiring 25 years ago he was secretary of the former Lockwood-Leutkemeyer-Henry Co., wholesale hardware firm.

♦

A. D. Byers, 38, manager of Fisher Body Co.'s St. Louis plant, in that city, recently.

♦

Frank B. Sweet, 49, assistant secretary and purchasing agent, Swedish Crucible Co., Detroit, in that city, Nov. 1.

♦

William F. Krichbaum, 61, chairman of the board and former president, Foster Engineering Co., Newark, N. J., Oct. 31 in that city.

♦

Kenneth B. MacLeod, 46, vice-president, Abrasive Machine Tool Co., East Providence, R. I., Oct. 24. He had been with the company 21 years.

♦

Carl G. Barth, 79, a mechanical engineer and inventor, who had been consultant on scientific management to many industrial firms, at his home in Philadelphia, recently.

♦

Philip J. Hahn, 81, head draftsman of the electrical transformer department, Allis-Chalmers Mfg. Co., Milwaukee, prior to his retirement a year ago, in that city, Oct. 28.

♦

John M. Cowmeadow, 70, night superintendent, W. H. Davey Steel Co., Cleveland, and a former night superintendent of the Canton, O., tin plate works of Republic Steel Corp., Oct. 30 in Cleveland.

♦

Mark Elliott Sr., 74, Oct. 31 in Virginia, Minn. Before retiring in 1936 he was general superintendent of Minnesota and Michigan iron ore mines for Interstate Iron Co. and Jones & Laughlin Ore Co., subsidiaries of Jones & Laughlin Steel Corp.

♦

James P. Walsh, 80, prominent coal and shipping executive before his retirement 15 years ago, Nov. 6 at the home of his son in Shaker Heights, Cleveland. Mr. Walsh was for 30 years vice president, Pittsburgh Coal Co., and after retirement continued with the company in an advisory capacity for a number of years. He also was president, General Coal Co., Pittsburgh, and secretary-treasurer, Carnegie Metals Co., Pittsburgh, holding those offices several years after leaving the Pittsburgh Coal vice presidency. He formerly was on the boards of Midland Steamship Line Inc. and Pioneer Steamship Co., and at one time was general sales manager, M. A. Hanna Co.

Editorial

Business and the 1940 Elections

■ NOW that the neutrality debate is out of the way, our economic problems again are coming up for active public discussion. Political leaders realize that the struggle between the friends and foes of business is likely to have a profound effect on 1940 election results. The mere fact that a growing number of aspirants for high office are lining up on the side of business is encouraging, for no sensible politician can be expected to espouse an unpopular cause.

The 7-point program on which Senator Robert A. Taft of Ohio would seek a Republican victory in 1940 is one that should merit approval from all friends of business, regardless of party affiliations. He favors: An approach toward reduction in the cost of government and the balancing of the budget; repeal of the payroll tax; repeal of the capital gains tax; amendment of the wages and hours law to make it strictly a minimum wage law; amendment of the national labor relations act; abandonment of attempts to fix prices in basic industries; repeal of the Guffey coal act.

Pennsylvania Points Way to Better Conditions by Encouraging Industry

With such a program, Senator Taft should appeal strongly to all who believe that permanent prosperity can be attained by friendly stimulus to, rather than hostile reform of, business.

A striking reflection of the changing attitude toward business is the full-page advertisement which recently appeared in nationally-read publications with this catchline: "Mr. Businessman . . . Something Has Happened in Pennsylvania." The advertisement goes on to say: "Pennsylvania has a new administration, sympathetic and eager to help business and the worker. Its aims: To create more jobs in private industry, cut down the number of jobs supported by taxes."

Belief Gains that Prosperity Comes Only from Increased Business Activity

Impressive is the record of the new Pennsylvania administration. It has reduced state payrolls by 17 per cent, and state administrative expense by 20 per cent. Relief rolls were cut by 175,000 from Jan. 7 to June 3 of this year, most of these people finding employment in private industry. The state employment service has found 66,861 new jobs. In six months $32,000,000 has been expended on industrial expansion in the state.

Like most of the country, Pennsylvania for a while forsook time-tried economic principles and threatened to kill the goose that laid her golden eggs. In this process business was nearly scared to death. Episodes that characterized this period, such as the state administration's conduct during the Johnstown steel strike, will not soon be forgotten. But all that now seems to be over.

The big majorities by which Ohio and California last week rejected utopian old-age pension plans that would have driven business out of those states as a result of crushing new tax burdens clearly demonstrated how the tide is running.

It would be unfortunate if subsequent developments—as a war boom, war emotionalism or our own possible participation as a belligerent—should prevent this basic issue from being the dominating one in the 1940 campaign.

The BUSINESS TREND

Rate of Industrial Activity Appears To Be Leveling Off

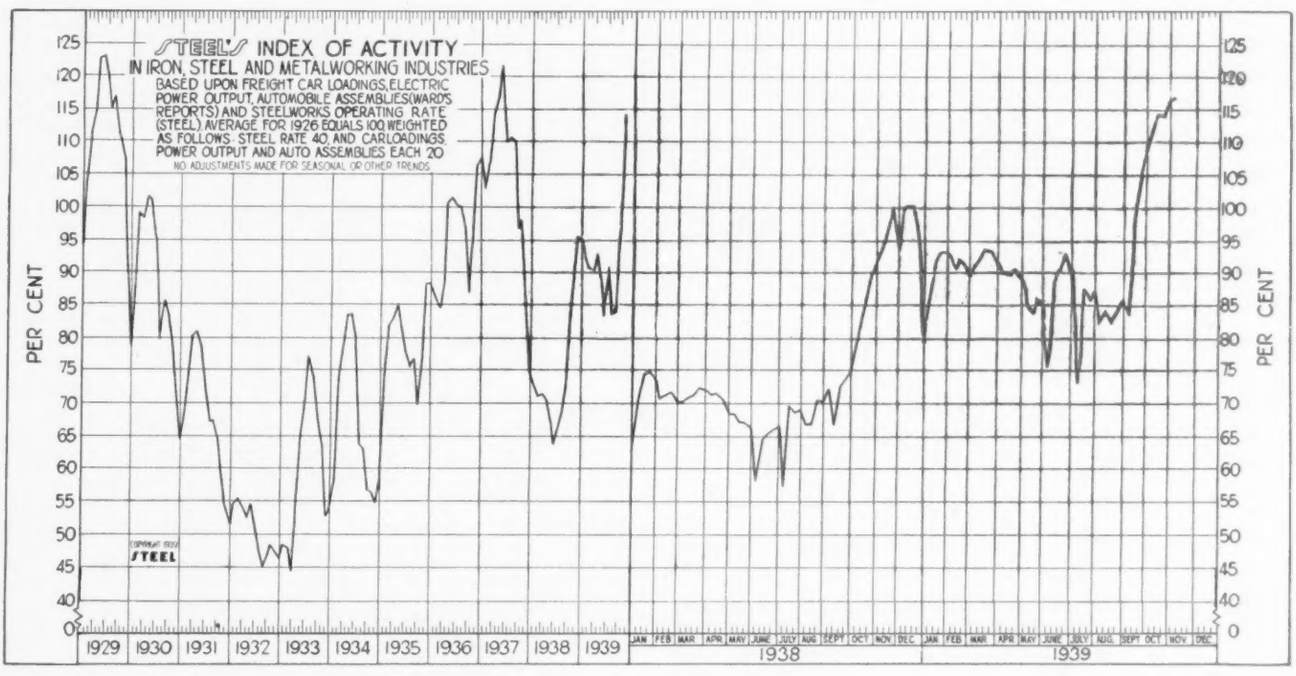
■ A LEVELING-OFF process in industrial activity now appears to be underway, following the sharp upturn through September and October. While many industrial indexes recorded further improvement the past week or two the gains have been generally small, reflecting the obstacles involved in putting new or reconditioned equipment into production.

Individual industries for which weekly operating schedules are available appear to be near to capacity levels. Operations in many instances are at a practical peak, further advances being restricted by either materials supplies, shipping facilities, or productive equipment.

The capital goods industries, such as steel, railroad equipment, machine tools and industrial engineering construction, which shared prominently in the upsurge of business activity since early September, give no indication of receding from the near to capacity operations now maintained.

Reflecting a further advance in the national steel rate and automobile production, STEEL'S index of activity moved to still higher levels to 117.1 during the week ended Nov. 4. This represents a gain of 0.9 points over 116.2 level recorded by the index during the preceding week and also compares favorably with the index figure of 93.4 for the corresponding week a year ago. The index has now reached the highest point since the week ended May 22, 1937.

The gain of 1 point in steelmaking operations to 93


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS.
PER CENT
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity advanced 0.9 points to 117.1 in the week ended Nov. 4:

Week ending	1939	1938
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3
Sept. 2	86.3	72.3
Sept. 9	83.7	66.8
Sept. 16	97.5	72.9
Sept. 23	103.0	74.0
Sept. 30	107.9	74.9
Oct. 7	112.5	78.9
Oct. 14	113.9	84.3
Oct. 21	113.6	88.7
Oct. 28	116.2	91.4
Nov. 4	117.1	93.4

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	114.0	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

per cent for the week ended Nov. 4, places this important industrial indicator at the highest level since the week ended Aug. 17, 1929. A year ago the national steel rate stood at 57.5 per cent, while in the comparable 1937 period steelworks operations were at 47 per cent. Close to the present level of steelmaking operations is expected to be maintained through the remainder of this year.

Automobile production forged ahead to a new high for the seasonal fall upturn during the week ended Nov. 4, despite nearly complete cessation of operations in the Chrysler plants due to the strike. In that week assemblies totaled 82,690 units, against 78,210 the week ended Oct. 28 and 75,830 in the comparable week a year ago.

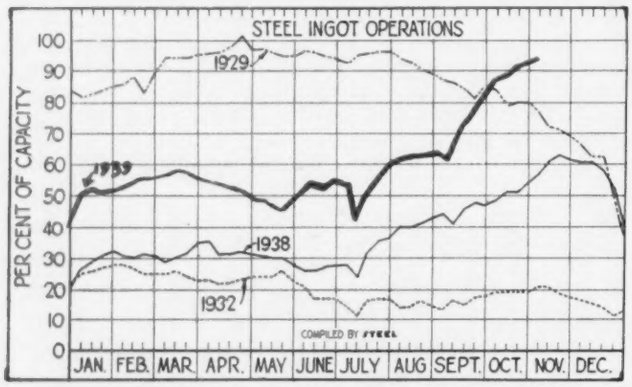
FOREIGN TRADE EXPANDS

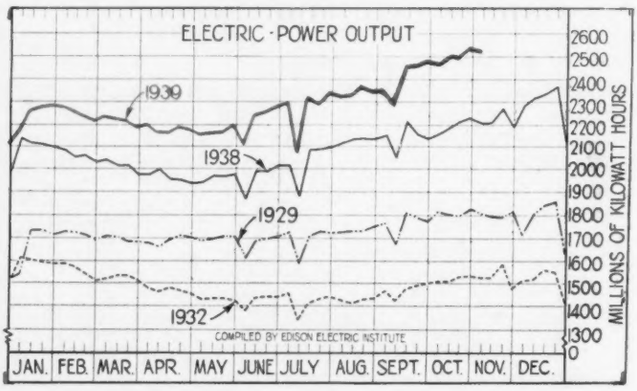
Foreign trade of the United States during September extended the improvement that got underway during August. Exports last month totaled $288,573,000, an increase over the export total of $250,839,000 recorded during August and also compared favorably with the total exports reported in September, 1938, of $246,335,000. Imports during September aggregated $181,461,000, against $175,756,000 in August and $167,592,000 in September, 1938. Exports during the first nine months this year aggregated $2,184,894,000, compared with $2,295,447,000 during the comparable 1938 period. Imports in the nine months ended Sept. 30 amounted to $1,620,646,000, against $1,434,871,000 in the same period a year ago.

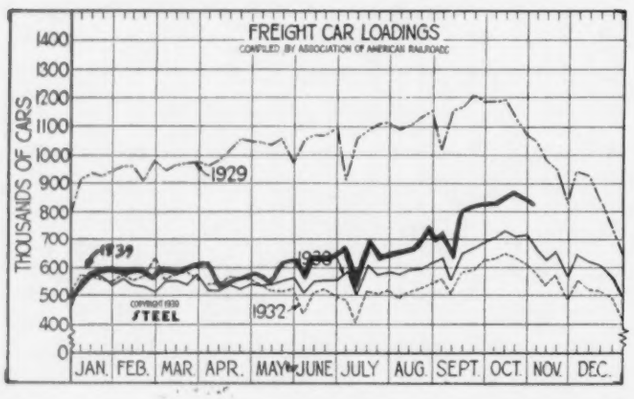
Iron and steel foreign trade followed the general trend during September. Both exports and imports of iron and steel products, including scrap, recorded improvement during the first month of the war. Exports for September totaled 575,613 tons, against 477,078 in August and 341,458 during September, 1938. Imports amounted to 29,874 tons in September, compared with 28,328 during August and 27,957 in the corresponding 1938 period.

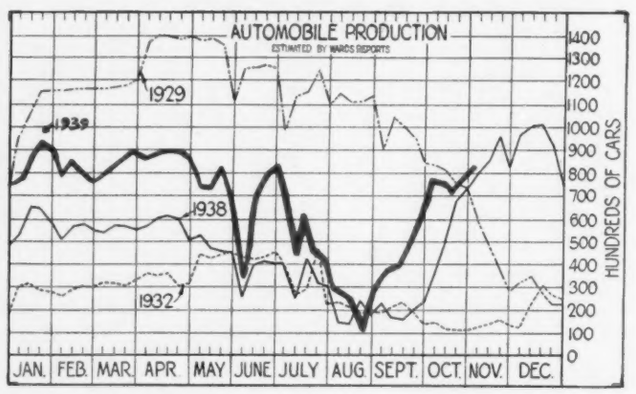
FREIGHT CAR AWARDS DECLINE

Despite the large number of freight cars placed during September, the total cars awarded last month fell only moderately below the September total. Awards during October numbered 19,634 cars, compared with 23,000 in September and 2537 in October, 1938. Total freight cars placed in the first ten months this year numbered 55,090. This compares with 12,490 cars awarded during the comparable period last year; 51,061 cars in 1937 and 39,523 during first ten months of 1936.

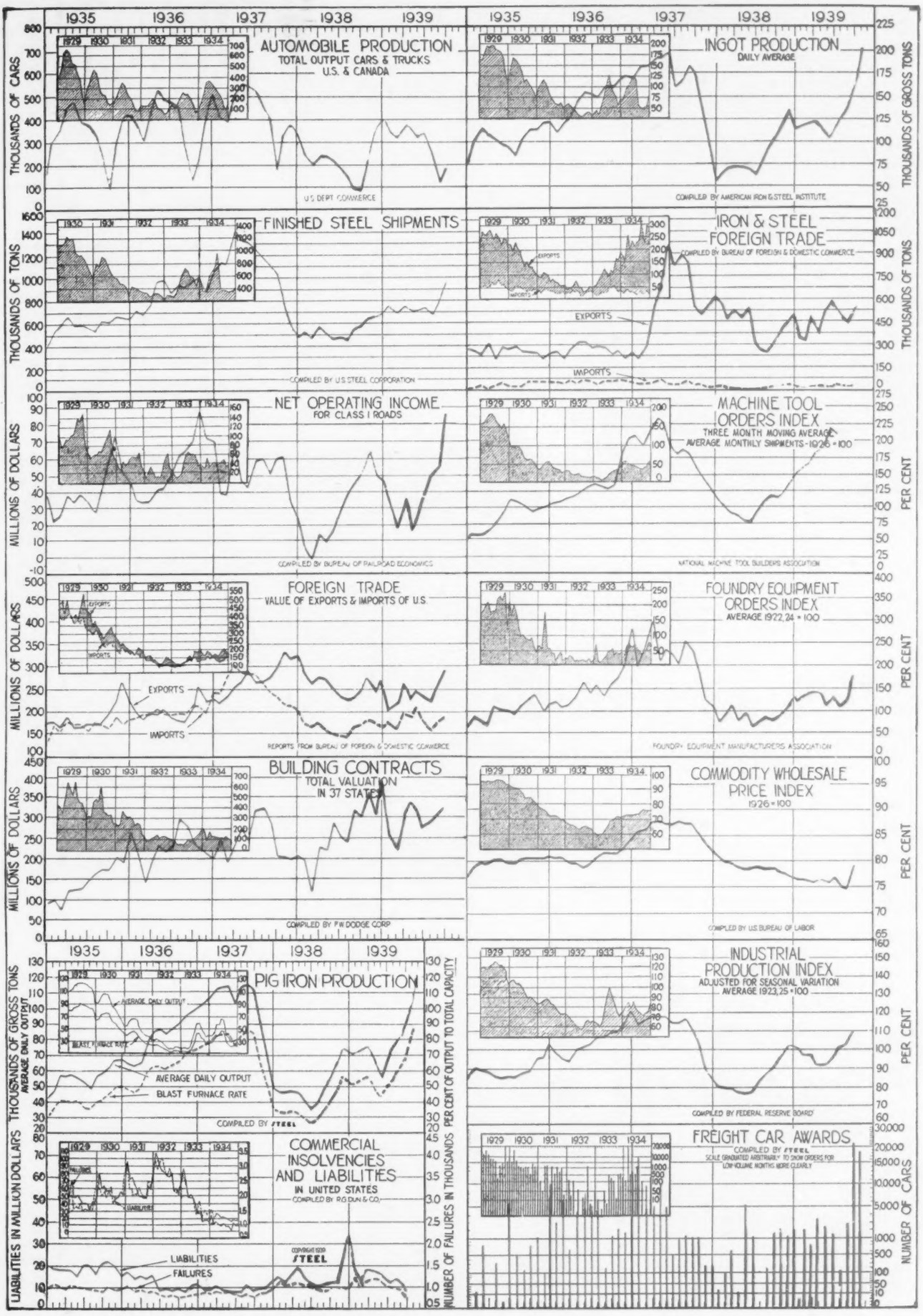




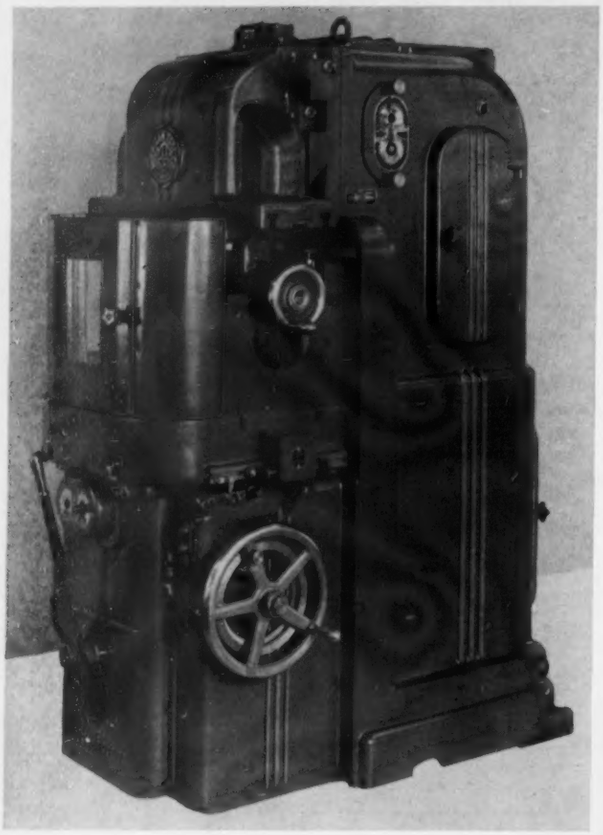




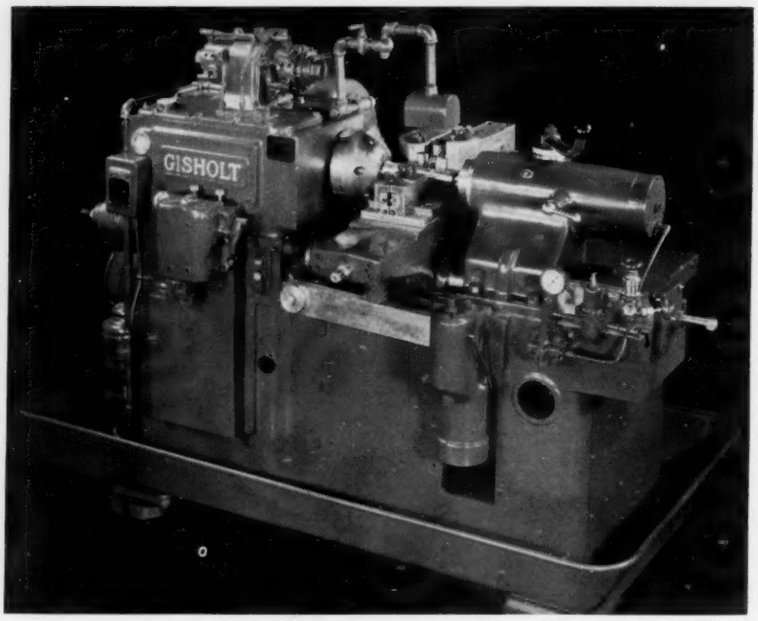
Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
July 22	56.5	36.0	16.5	96.0	2,295	2,085	1,433	1,723	657	581	502	1,101	47,420	32,070	46,375	123,512
July 29	60.0	37.0	16.5	96.0	2,342	2,094	1,440	1,725	660	589	511	1,104	40,595	30,390	22,461	110,163
Aug. 5	60.0	40.0	14.5	94.0	2,325	2,116	1,426	1,730	661	584	497	1,091	28,250	14,771	23,591	114,364
Aug. 12	62.0	40.0	14.5	93.0	2,333	2,134	1,415	1,733	661	589	512	1,100	24,875	13,790	21,162	111,939
Aug. 19	63.5	41.5	15.5	90.0	2,368	2,139	1,431	1,750	674	598	518	1,136	12,955	23,940	19,568	111,902
Aug. 26	63.5	43.5	14.5	89.0	2,355	2,134	1,436	1,762	689	621	538	1,160	18,365	18,700	19,896	113,316
Sept. 2	64.0	44.5	13.5	87.5	2,357	2,149	1,464	1,675	722	648	561	1,017	25,240	22,165	19,561	90,913
Sept. 9	62.0	41.5	15.5	86.0	2,290	2,048	1,423	1,806	667	569	501	1,153	26,865	17,485	21,586	104,351
Sept. 16	74.0	46.0	15.0	84.5	2,444	2,215	1,476	1,792	806	660	587	1,166	41,245	16,100	23,116	100,042
Sept. 23	79.5	48.0	17.0	82.0	2,449	2,154	1,490	1,778	815	676	596	1,202	53,950	20,390	19,327	95,453
Sept. 30	84.0	47.0	18.0	85.0	2,470	2,139	1,499	1,819	835	698	622	1,179	62,755	25,405	13.265	83,201
Oct. 7	87.5	48.5	19.0	84.0	2,465	2,154	1,506	1,806	835†	703	625	1,179	76,095	37,665	14,568	82,088
Oct. 14	89.5	51.5	19.5	79.0	2,495	2,183	1,507	1,799	845	727	650	1,186	75,860	50,540	12,675	81,882
Oct. 21	91.0	51.5	19.5	80.0	2,494	2,214	1,528	1,824	861	706	642	1,134	70.114	59,860	11,165	76,870
Oct. 28	92.0	54.5	19.5	80.0	2,539	2,226	1,533	1,816	834	709	617	1,072	78,210	65,335	11,117	73,048
Nov. 4	93.0	57.5	21.0	77.5	2,537	2,207	1,525	1,798	805	673	587	1,050	82,690	80,030	12,257	61,824


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT. COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
THOUSANDS OF GROSS TONS
PER CENT
NUMBER OF CARS
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
PER CENT OF OUTPUT TO TOTAL CAPACITY

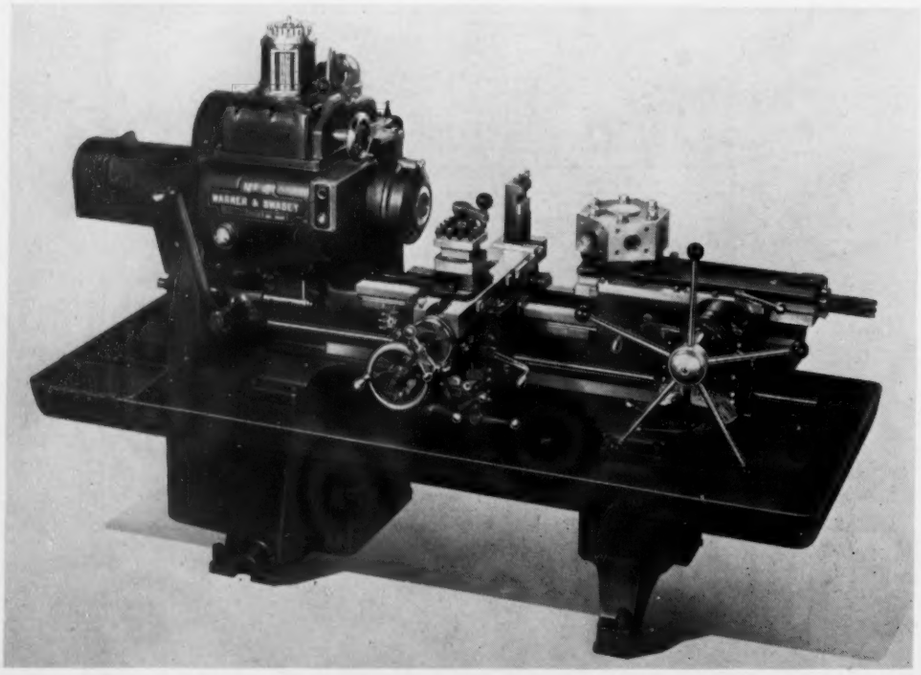
VERSATILE



■ Michigan 860-A rotary crossed-axis gear finisher, left, finishes gears up to 5 inches in width as well as splines on long shafts without requiring wide cutters. Maximum distance between work carrying live centers is 18½ inches, but may be increased to 25½ by special headstock. Selector switch permits rapid change from underpass to transverse feed method of finishing gears. Feed has separate motor drive equipped with plugging timer for quick stopping. Speed of head controlled by change gears and length of transverse stroke by limit switches. Machine is available in three sizes for gears up to 8, 12 and 16 inches in diameter. Michigan Tool Co., 7171 E. McNichols road, Detroit



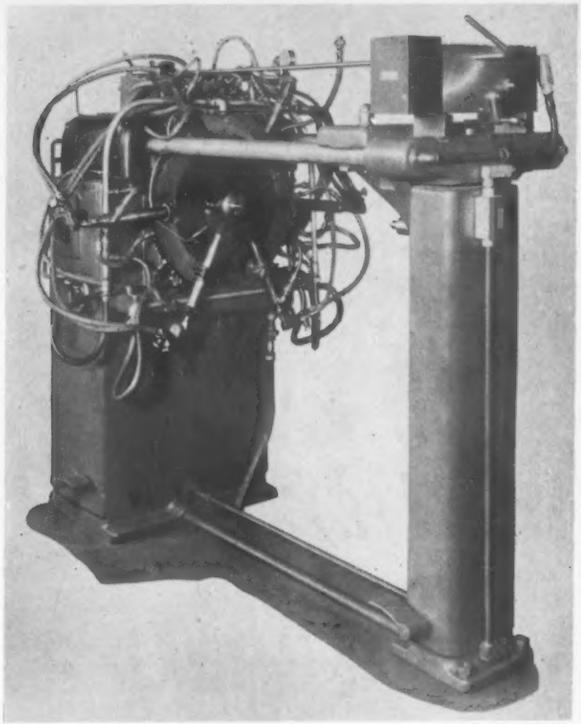
■ Gisholt No. 12 hydraulic automatic lathe, right, has single lever operated tailstock with air clamp and is fully automatic in operation. A large volume gear pump provides fluid power for moving slides at traverse rate and individual plunger pumps supply accurately metered fluid for advancing slides at rate of feed desired. Traverse and feed trips are adjusted by stop screws. Bed and headstock are a one-piece nickel semi-steel casting. Gisholt Machine Co., Madison, Wisc.

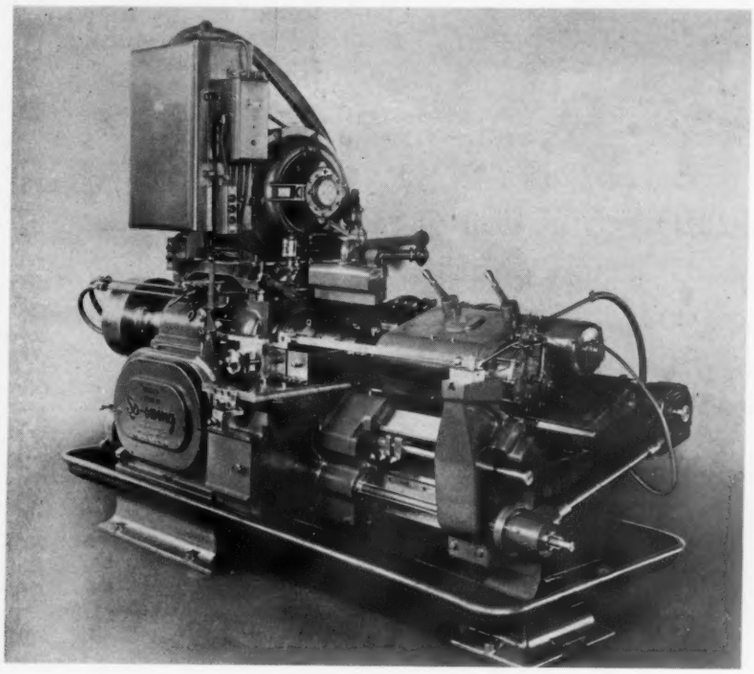


■ Warner & Swasey No. 4 ram type turret lathe, left, is equipped with a preselector head and head brake. It has bar capacity of 2 inches, with 18⅛-inch chucking swing. Only one lever is required to shift gears. Headstock has improved force feed lubrication with oil reservoir in base of lathe. Bed features diagonal ribbing similar to bridge truss bracing. This gives 30 per cent more rigidity with no increase in weight and allows more chip clearance. Universal cross slide has six reversible power feeds, both cross and longitudinal. Hexagon turret has adjustable stops for automatically tripping feed for each turret face. Warner & Swasey Co., 5701 Carnegie avenue, Cleveland

New Machines

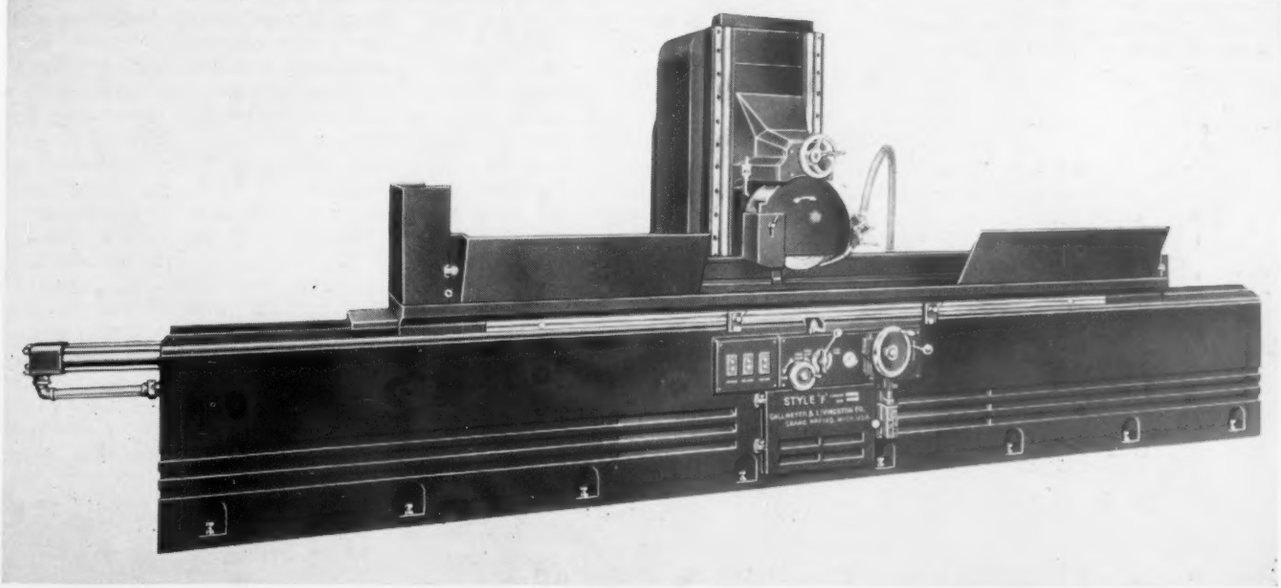
■ Fellows flame hardening machine, right, presents a method for local hardening of gear teeth and other parts made from oil hardening stock. Work is held on stub arbor or between centers and can be rotated at 125 to 600 revolutions per minute. Work is surrounded by six nozzled torches which quickly bring it up to heat. Torch equipment slides on saddle. Work is removed by treadle-operated ejector. Transfer device immerses work in quenching medium. Capacities: Gears, up to 12-inch diameter and 2-inch face; shafts, up to 36 inches long. Fellows Gear Shaper Co., Springfield, Vt.





■ Seneca Falls model R-14 Lo-Swing lathe, left, incorporates an all-mechanical quick change-over mechanism which makes it possible to change the stroke by setting a graduated dial. Lathe will handle heavy multiple tool turning work up to 11 inches in diameter and 36 inches between centers and can be supplied with an overhead third arm. Seneca Falls Machine Co., Seneca Falls, N. Y.

■ Gallmeyer & Livingston production type hydraulic feed surface grinder, below, has maximum longitudinal table speed of 150 feet per minute, attained by means of a Vickers tandem pump. Standard machines are available in sizes up to 24 x 144-inch working surface, clearing up to 25 inches under the wheel. Longitudinal and transverse table movement is sufficient to permit grinding over entire working surface with standard wheel. Vertical movement of wheel head is controlled by graduated handwheel reading to 0.0001-inch. Machine is built around heavy one-piece column and base casting and no part of working surface overhangs base. Gallmeyer & Livingston Co., Grand Rapids, Mich.



New Plants FOR OLD

As shown here, there are ways to prevent loss of employment, taxes, devaluation of real estate and general demoralization caused by closed shops. Far-sighted companies aid in rehabilitating plants they find necessary to abandon

By R. R. HETZ
General Manager
Hetz Construction Co. Inc.
Warren, O.

■ POSSIBLY the factors that influence an industry or a manufacturing company in its choice of a location can be divided into two classifications. The first might include such factors as presence or nearness to natural resources, transportation facilities, geographical advantages, etc. The second classification might cover such items as attitude in general of the community toward industry, prevailing type of available workers, the latitude given professional labor leaders, tax rates and assessment policies of the community, etc.

The first factors may be termed uncontrollable by a community. However, the second set of factors is quite definitely controllable. More often than not, the controllable factors of the community will outweigh by far the uncontrollable factors in an industry's decision to locate in any given community.

Early industrial areas in the East grew up largely around natural resources. A community was built around an industry rather than the industry being attracted to an already built-up community. Thus industries came to these locations through little or no effort on the part of the citizens.

In recent years with the rapidly changing industrial picture, more than one community has been rudely awakened to find its industries gone and the community about to collapse. Only after industries are taxed out of existence, or have exhausted their natural resources, or have been forced by competitive conditions to move to more advantageous locations do the citizens become sufficiently aroused to take notice of the situation. Usually it then is too late to retain the industries. Extravagant spending has buried more than one community in debt so far that it was unable to reduce its tax to a bearable rate.

However, a good example of what can be accomplished is the case of a well-known New England community which found itself in precisely the predicament outlined above. When one of the last industries was forced to abandon operations, the leading citizens finally woke up to the fact that the savings in their homes and banks were directly tied up with industrial progress and the industrial health of their community. With the need so definitely staring them in the face, this community tightened its belt and in spite of declining tax revenue as well as mounting unemployment actually cut its expenses and was able to reduce its tax rate.

Then they sent representatives out to learn why industries no longer found their town attractive. This was followed by taking steps to remedy the situation wherever possible.

When the abandoned plant of this company was offered for sale, community leaders purchased it at auc-

tion and busied themselves with contacting industries in an attempt to coax them back to their city

Almost overnight there was a change in the community from complete indifference toward industry to an attitude of extreme helpfulness. This community went so far as to promote even small plants where only a handful of men were employed. As a result, this community now has restored its industrial activities to their former level, and it again is a prosperous place in which to live.

The fact is that communities are like individuals. This may be fortunate in that only those which have enough ambition to help themselves may benefit by this scheme as there are only enough available industries to restore industrial activity to those few communities willing to put their house in order.

The Hetz Construction Co. Inc., Griswold street, N. E., Warren, O., has recently endeavored to rehabilitate the industrial picture in a number of communities. Previously when a large plant was made vacant, salvaging concerns bid on the job, the successful bidder then tearing down the building and salvaging as much material from it as possible. What remained constituted an unsightly area in the town. Not only that, but it usually meant a serious drop in employment as well as available tax revenue. Quite often the dismantling of a large plant in a small town practically bankrupts the town.

A typical example of what this company has accomplished in disposing of such plants is the history of the American Locomotive plant at Richmond, Va. This plant, sketched in Fig. 1, was entirely too large to be sold to any one company for occupancy. The ablest real estate brokers had tried for years to sell it as a unit but without success. However, they did have several opportunities to sell portions of the plant to smaller companies, but the owners were reluctant to split it up since they were much concerned as to what would become of the balance of the plant. They were not in the real estate business.

By dividing the plant into several small parcels, however, it was possible to offer something attractive to small companies, and in nine months they were able to dispose of better than 50 per cent of the floor area to other industrial concerns. Of course, some of the buildings were unsuitable for further use and had to be dismantled. However, history of the other buildings is interesting.

Richmond Structural Steel Co., already having a plant in Richmond, took over a section of the available space for an addition to their facilities. This company makes bridges and other structural steel fabrications, and now occupies the area at the left in Fig. 1. This was purchased at much less cost than a similar addition to its previous plant. This company is now equipped to handle much larger work since moving into its new buildings.

Out-of-Town Concerns Move In

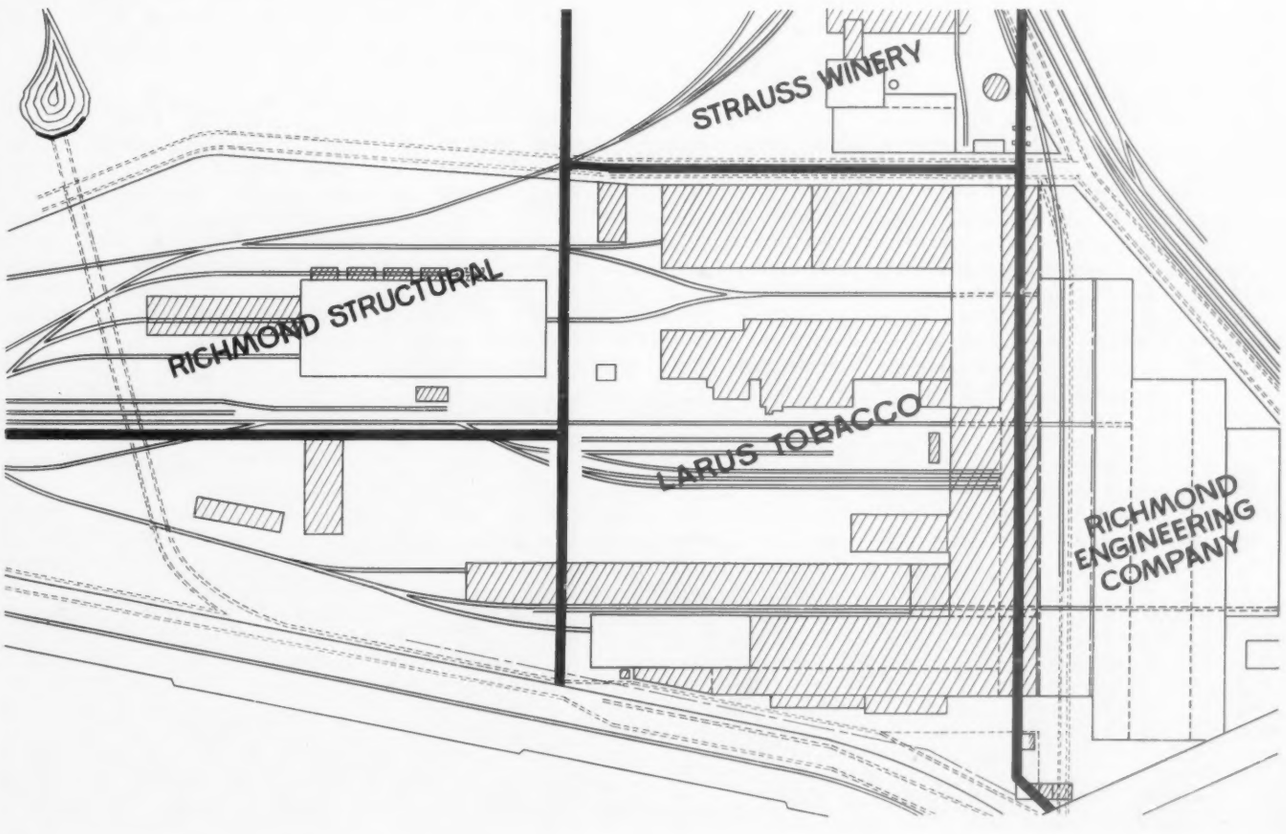
Strauss Winery came in from out-of-town to occupy the buildings at the upper right in Fig. 1. This company uses the boilers already located in these buildings to advantage in their processing work.

Larus Bros., cigar manufacturers, also came from out-of-town to occupy the centrally located buildings in this group.

Richmond Engineering Co. occupies buildings at the right. Here are manufactured water tanks, hot water heaters, septic tanks, etc. This company has been able to increase its output several hundred per cent due to more efficient buildings.

There are a number of attractive points about such old plants which aid their disposal in this manner. Usually a large building will have a crane and runway available for handling heavy materials from point to point. Such cranes are almost always usable by the new occupant. Quite often the boilers used to furnish steam for heat and processing

Fig. 1——This large property of American Locomotive Co. at Richmond, Va., was disposed of successfully to a number of concerns by methods outlined here. Diagram not complete or to scale



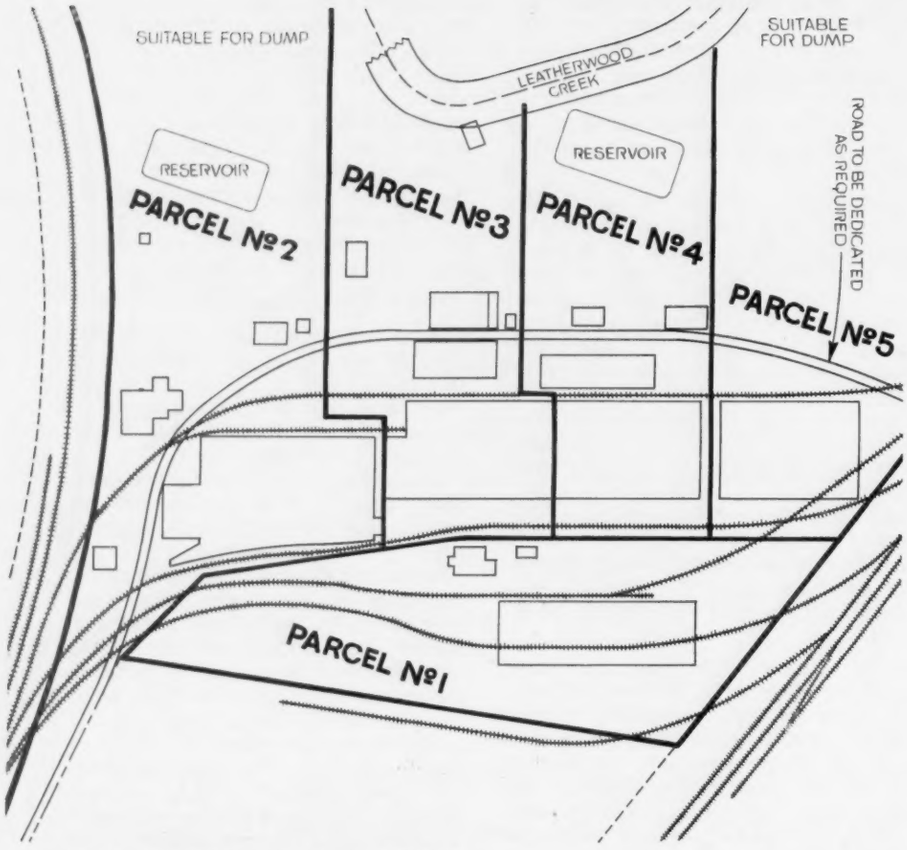


Fig. 2—Cambridge, O., plant of United States Steel Corp. now being liquidated is tentatively divided as shown for relocation of other industries. Sketch not complete or to scale

operations also can be used by a new occupant. Since in all cases the buildings are sold at practically scrap value, the cost to the new occupant is extremely low. Cranes, boilers and other installed equipment are obtained at a fraction of the cost of new equipment.

Other factors which make such plants attractive to new occupants include a good community attitude, good labor conditions, low tax rates and a friendly interest in the new industries. Banks and other institutions in a community as well as the townspeople, including both businessmen and workmen, are found most co-operative because they all realize the importance to the community of the new industries. This helpful attitude is something to be considered.

When taking over an old plant in an endeavor to rehabilitate it and interest new industries, all the buildings are carefully examined. Those most suitable for new industries are placed in first class condition. Buildings in poor condition are torn down. It sometimes requires considerable length of time to contact new industries, to interest them in the proposition and conclude the deal. However, it is found that even though it takes as long as one and a half years to sell the property, a satisfactory turnover can usually be made.

Besides the Richmond, Va., plant, the Hetz company has successfully disposed of other plants in the manner described above. These include the old McFarland automobile plant at Connersville, Ind. Here two acres of buildings were sold, half of the floor space going to an enameling company for a warehouse and the other half to local stamping mill for manufacturing activities.

At Greenville, Pa., two acres of buildings, formerly a foundry, are now being sold. Part of the area already has been taken over by a new occupant and is to be used as a machine shop.

Costs Less Than Plant Addition

At Niles, O., three acres of floor space formerly occupied by Niles Pottery Mills were rehabilitated. There was one good building here surrounded by a number of poor ones. The good building was made attractive by removing the poor surrounding buildings. Then this building was sold to Allied Metal Co. of Warren, O., for making stamped metal parts. Allied Metal purchased the building for less money than an addition to their own building would have cost them.

Quite often the rehabilitated plant has a higher tax value than before because it has been put in first-class condition. This is true even where some of the older buildings have of necessity been torn down.

In an endeavor to prevent loss of employment to the communities, United States Steel Corp. was among the first to adopt a co-operative policy with regard to plants it found necessary to abandon. Formerly such plants were often completely dismantled. In attempting to fill the vacancy in the community left by discontinuance of such plants, the corporation now endeavors to see that the buildings are disposed of to other concerns. Also, the cost of completely dismantling a plant often ate up the value of the scrap of the building so that it was an unprofitable operation.

The Cambridge, O., plant of United States Steel Corp. is now being disposed of by Hetz Construction Co. The liquidation agreement provides that the building be dismantled only after every reasonable possibility has been exhausted to obtain new industries for the community.

Fig. 2 is a diagram of tentative division of the plant. Some of the buildings are suitable for heavy industries such as fabricating shops, forge and machine shops, foundries, etc. Others are suitable for light manufacturing such as stamping, electroplating, finishing and similar work. Although the Cambridge plant has been subdivided tentatively into parcels as shown in Fig. 2 to make it more attractive to smaller industries, the plans are quite flexible and the arrangement can be shuffled around to suit the convenience or requirements of the purchasers.

Cost To Purchaser Is Nominal

Prices in property of this class are very little if any in excess of salvage value of the materials contained in the building plus a nominal figure for the land. In addition to the Cambridge job, there are similar plants at New Eagle, Pa., and Greenville, Pa., in which industries now are being relocated. The Hetz company also has recently purchased the Ionia, Mich., plant of the Hayes Body Corp. for relocation of industry. The plant is in excellent condition and will divide up into four building groups.

Although rehabilitating shutdown plants as described above is a relatively new project, it appears that when combined with efforts of chambers of commerce at the various locations, considerable good may be accomplished for the communities involved. Hetz company's experience indicates that a community really can do a great deal to restore its industrial and commercial life by making itself attractive to new industries.

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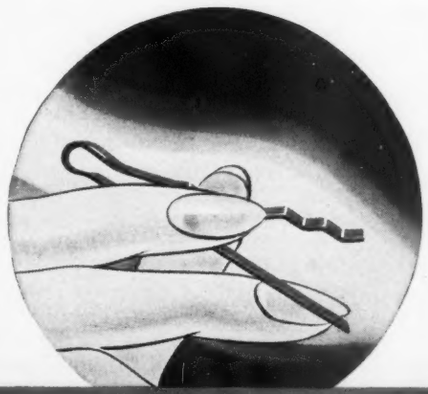

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Strip Welding Practice

Improved flash welding of strip for continuous pickling lines and the like results from using lower current, slower flashing rate and slightly longer flashing period. This produces the soft welds desired for subsequent cold reduction

By J. H. COOPER
Welding Engineer
Taylor-Winfield Corp.
Warren, O.

■ PRECEDING articles in this series have described a number of recent developments in connection with modern resistance flash welders and trimmers for continuous pickling lines and similar steel mill service. These machines and the modified procedure employed with them involve a number of important principles.

The fact that the weld metal must be sufficiently ductile to permit a reduction in thickness when going through cold-finishing mills brings up a number of requirements. Obviously, the welds must not break. They must also be soft and ductile. Hard welds may damage the roll surfaces and are more brittle. Usual flash welding applications do not require the low hardness and high ductility so necessary for successful flash welding of strip for subsequent cold reduction.

In attempting to make welds soft and ductile, it was found that by flashing them fast with high current, welds were obtained which were harder than the steel strip by approximately 20 to 25 points Rockwell C. The hardness differential of the weld compared with the adjoining base stock is used as the criterion because the strip itself varies rather widely in hardness and the hardness differential of the weld over the strip affords a convenient yardstick for comparing ductility of weld and strip stock.

Checking Weld Hardness

Hardness of the strip can be checked readily, but care must be taken in determining hardness of the weld. This weld is a narrow zone which in strip 0.095-inch thick is only 0.010 to 0.015-inch wide. Weld test specimens must be prepared carefully by first grinding the surface bead down to the level of the strip. This grinding must be done under water to keep from changing hardness due to heat of grinding. After being ground, surface should be polished with fine emery cloth and etched with reagent such as ammonium persulphate. This is necessary to show up the line of the weld. When obtaining the hardness readings on the Rockwell machine, care must be exercised to keep the braile squarely on the weld center for if it slips off to either side of the weld, a false hardness reading will be obtained.

There seems to be a minimum to the differential obtainable as it has been impossible to drop below a 10 to 15 point Rockwell C range on anything done up to the present time to our knowledge. However, as there is a wide variation in the hardness of the strip steel itself, this differential is not at all excessive, and welds are being rolled in several installations quite satisfactorily. The above minimum differential was obtained by using a slower flashing rate and lower flashing current.

For other articles in this series on modern strip welding practice, see STEEL, Aug. 21, 1939, p. 48; Aug. 28, p. 42 and Sept. 4, p. 54 . These treat the subject from many angles including handling of the strip and trimming it

The current to give this hardness differential runs around 3000 amperes per square inch of welded cross section and appears nearly a constant current density, regardless of width or thickness of strip. This current value is measured as the average of a jagged current wave registered by an oscillograph during flashing period. This value is approximately 1/3 to ¼ of the current that would be used if it were not necessary to cold reduce the resulting welds which must take approximately a 2/3 reduction in thickness during the cold-rolling operation.

The values mentioned here have been obtained working with 0.06 per cent carbon steel. As carbon content predominates in determining weld hardness, it is necessary to revise the standard of what constitutes a proper differential of hardness of weld over strip stock if high-carbon steel is welded.

Factors Controlling Hardness

The three factors which enter into controlling the hardness differential appear to be:

The amount of strip between the dies at completion of weld.

The welding current per square inch of welded cross section.

The flashing rate.

To increase the amount of steel between the welding dies, the final die dimension is opened as much as possible consistent with maintaining strip alignment. The heat rate input is cut down by reducing welding current and flashing rate. This technique brings the hardness of the weld to within 10 to 15 points Rockwell C over that of the parent metal, apparent the lowest hardness differential now obtainable. A differential not in excess of these values appears essential for successful rolling of strip steel in the cold mill.

In ordinary flash-welding technique, the flashing period is made short to obtain maximum produc-

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tion from the machine. In strip welding such as discussed here, however, all factors are determined by the conditions necessary to make the very best possible weld. As stated above, this may involve a flashing period slightly longer than usual.

A most necessary part of the technique of obtaining lower current is a slower flashing rate.

Accurate control of flashing rate, or speed at which metal is burned off as the two ends are moved together during the first stage of welding, is another important essential. The current per square inch of cross section is determined by the flashing rate, as current is dependent on length of arc for any set of other conditions. It increases as the arc is shortened by a faster rate of flashing. For a given set of conditions, current varies with rate of flashing, following a hyperbolic curve. The low current, 3000 amperes per square inch of cross section, utilized in late model strip welders is obtained by decreased flashing speed.

As previously mentioned, it is desirable to have as much stock projecting from the dies as possible without the strip buckling or getting out of alignment. The purpose is to have a relatively large volume of steel not chilled by the clamping dies. Flash period then is prolonged sufficiently to permit the storage of heat in the projecting metal. This permits the cooling rate of the weld area to be retarded by the reservoir of heat contained in the adjoining projecting material, thus giving the weld time to anneal and resulting in the soft, ductile weld so highly desired.

At the end of the flashing period, there is a section of metal which is fluid in the edges with temperatures varying back to cold metal in the body of the stock. It is necessary to extrude the soft plastic material and bring together the correctly heated metal during upset. This operation has been made easier to accomplish by employing a longer flashing period to lengthen the heated strata.

Amount of Upset Affects Hardness

Metal upset is that material forced out of the welded joint as the two abutting ends are pushed together in a plastic condition at the finish of the welding cycle. By forcing the two ends together, a forged joint actually is obtained. It has been found that amount of upset has some bearing on the weld hardness. It is desirable to make the upset time as short as possible to keep oxidation of the molten metal to a minimum. Hydraulic controls are unexcelled for this purpose.

The amount of upset used is smaller than normally employed for equivalent gages of steel in other flash welding practice. This appears essential because the stock projecting out of the die is plastic for a greater dimension back from the center line of the weld. The strip edges will have a tendency to skid if too much upset is used. Therefore too much projecting stock involves a certain amount of alignment trouble. It is quite obvious that if a steel strip, 0.04-inch thick and projecting about 1 inch, is struck with high pressure, a certain amount of deflection will result. It is this difficulty of excessive deflection that limits the amount of stock which can be projected from the dies. Thus a compromise is essential to obtain alignment and still get a low hardness differential.

An interesting experience was encountered in making the center section of an automobile frame 18 inches long, employing a double weld. Some trouble was experienced several times from broken welds. The welder was a mechanically driven machine. After studying the process and cutting down the upset cams, thus reducing the amount of upset, it was found the trouble had been eliminated.

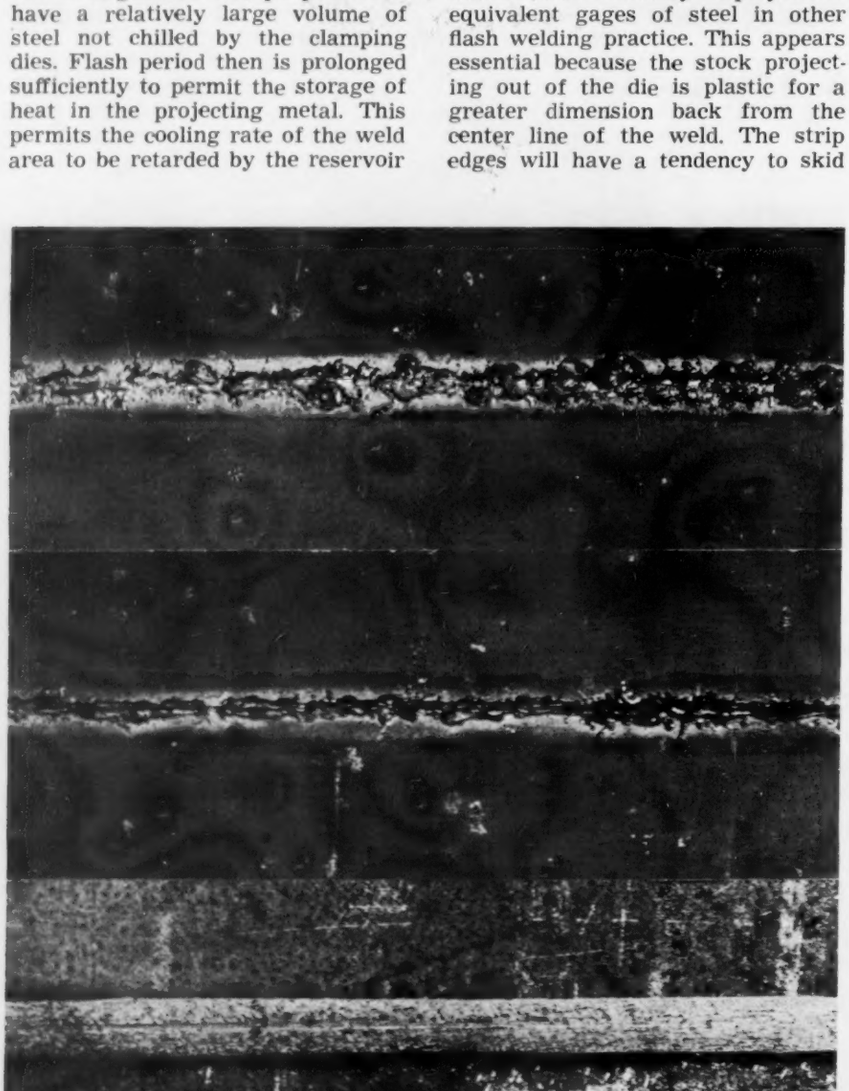
Upset Pressure A Hardness Factor

It is quite evident the greater the upset pressure, the higher the density of material at the weld. It is even thought possible to obtain weld metal of greater density than parent metal by this means. The higher density material is harder, and so upset pressure definitely does increase the hardness of the weld.

When welding different gages of stock, it is necessary to make adjustment for different amounts of upset, the distance the abutting strip ends are pushed together. For example, on 16-gage an upset of about 3/32-inch is used. There is a "rule of thumb" which indicates that from 1 to 1½ times the stock thickness should be allowed for upset. As the stock becomes thicker, this figure should go from 1½ to 1 times the stock thickness.

On ¼-inch stock, for instance, the upset is approximately ¼-inch. Using these figures as a rough guide, the weld is examined. Its character will indicate whether slightly more or less upset is required. Modern welders include a control which is calibrated to give vernier adjustment of amount of upset.

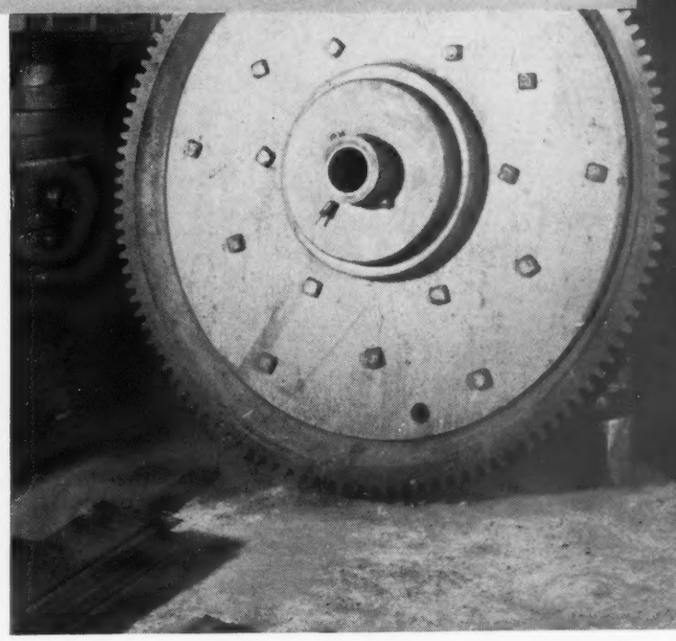
Another important adjustment is for amount of burn-off or flash. This is necessary to allow for various gages of stock as each gage has a different amount of burn-off for best overall results. As much could be flashed off of the thin gages as



Top, this is top surface of hot-rolled steel strip, 0.062-inch thick, as welded with mill scale. Center, view of bottom side of same strip. Markings on both sides are pit marks from the dies and are caused by the scale present. Bottom shows same strip after trimming

HOW THE SPEEDY EMERGENCY SERVICE OF A J&L WAREHOUSE SAVED THE FRANK F. TAYLOR COMPANY THE LOSS OF PROFITS FROM A COSTLY SHUTDOWN

Another example of J & L's partnership with American Industry



A plant operating full time — to fill immediate orders — then a fly-wheel cracks, causing what looked like a serious production delay. Mr. W. N. Muchmore of The Frank F. Taylor Company, Cincinnati, Ohio, writes as follows telling how the prompt cooperation of the J & L Cincinnati Warehouse helped him out of this difficult situation:

"During our extremely busy season, we had the misfortune of having a fly-wheel crack on one of our important Punch Presses. In order to keep this press operating until a new fly-wheel could be obtained it was necessary to repair the cracked fly-wheel. This required two pieces of 5/8-inch thick hot rolled steel 61½ inches outside diameter and 22½ inches inside diameter. The fly-wheel cracked at 8 P.M. and we needed the steel by 7:30 the next morning to keep the press running and our plant in production.

"We called our J & L representative, Mr. Guethlein, at his home about 9 P.M. and told him what we needed and when delivery must be made to our plant. Without hesitation, Mr. Guethlein said 'You will have it by 7:30 tomorrow morning.'

"Thanks to Mr. Guethlein and the Jones & Laughlin Warehouse the steel was delivered to our plant before 7:30 the next morning and in a very short time the press was operating again."

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is flashed off of ¼-inch stock, but this would be waste of time and material so the amount is reduced as stock thickness is reduced. The amount flashed is determined by the heat required to get the metal to a forging temperature all the way across the welded section. More heat is required for heavier stock than for thin stock. To avoid the waste of time which would ensue in unnecessarily flashing thin gages, a cam is provided on modern hydraulic welders, the adjustment of which cuts down the amount of burn-off. An adjustable cam on a mechanically driven welder is difficult to obtain.

To obtain the desired combination of soft welds and other physical properties, the stock must be prepared rather carefully. When shearing thick gages, it makes little difference if the stock is deflected a small amount vertically. But when shearing 0.04-inch strip, a deflection of 0.010-inch becomes an appreciable error.

It is necessary to consider how to avoid the possibility of die burns. When welding pickled strip, die burns cause little trouble. However, in welding a strip which has a heavy scale, the current often burns spots on dies at points where it pierces through the scale. Although this does not affect the welds, it does increase die maintenance. Usual practice is to put a processor ahead of the shear in the case of a pickling line to break up the heavy scale. This assists in avoiding excessive downtime for die maintenance and is of advantage, especially since minimum down time is most important. Clean dies are most essential for successful operation. If an operator permits small particles of flash to remain on the dies, strip edges may be thrown out of line, causing weld breakage when the material is rolled.

This is 0.062-inch sheet, welded, trimmed and cold rolled to 0.018-inch. The sheet is perfectly smooth but the photo accentuates the weld discoloration

Variations in width of strip must be accommodated. As far as welding is concerned, it makes no difference what the width of head and tail strips may be. However, effect on breakage when rolling is another matter.

In one installation, ¼ to ½-inch overhang on each side of the wider end was notched out with a little "half-moon" to cut out the width differential at the weld. However, this practice has been discontinued because it was found that the strip always went through the cold mill with the wider strip end as the leading edge of the joint; that is, always progressing from a wider to a narrower strip. If direction of travel were reversed, it might be necessary to bevel. In some installations, the whole sheet is side-trimmed on both sides before rolling.

Welder also must accommodate variations in end-to-end gage and in the coil width. In modern welders, a variation of 0.007-inch in handling stock as thin as 16-gage requires no lowering of the die. If when welding 0.025-inch stock, a thickness variation of 0.007-inch is encountered, then probably it would be advisable to lower the die as the percentage of error is greater.

After all the previously mentioned features of soft welds, amount of upsets, amount of flash-off, proper current and properly sheared material are attained, a good weld results. Next it is necessary to trim the weld as close as possible to keep the change in strip thickness at the joint to a minimum. Obviously, close trimming is an advantage when rolling the weld in the rolling mill.

Close trimming is essential also because with a differential of only 10 to 15 points Rockwell C in hardness and with a high untrimmed flash, the flash may act as a wedge when rolling the strip, tending to cut down through the strip with a shearing action since it is harder than the strip itself.

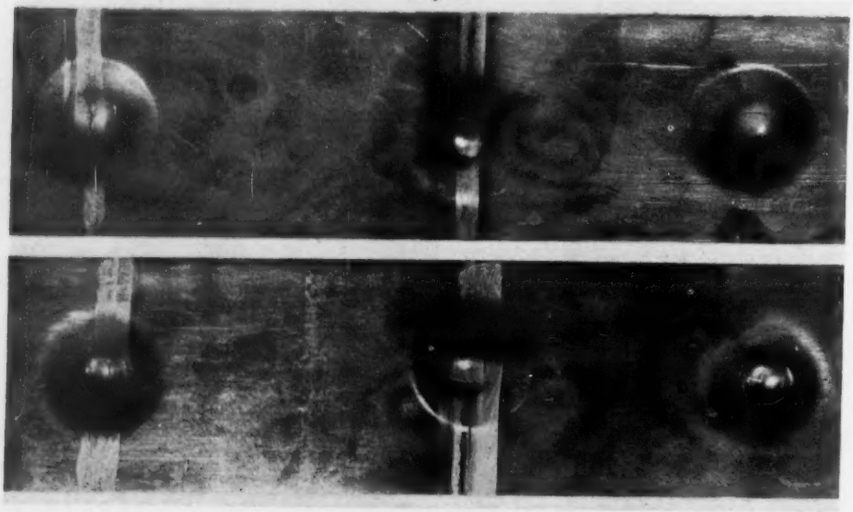
Breakage Reduced to 1 Per Cent

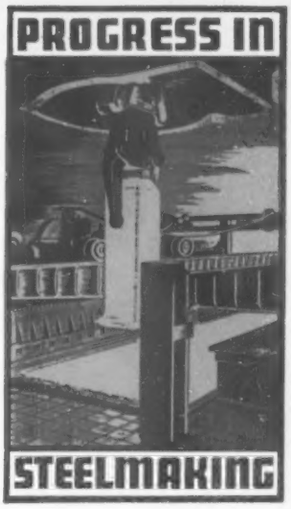
All the above factors are essential if breakage is to be kept to a minimum. On two recent installations, breakage has dropped to approximately 1 per cent by following carefully the principles outlined. When such a low figure as this is reached, it is extremely difficult to analyze just what causes the remaining breakage. It may be due to several things. There is some evidence which tends to show a certain amount of this 1 per cent breakage is due to variations in rolling tension on the mill. Some of the strip itself is broken, so if the strip itself breaks not in the weld, it is perfectly logical to believe that some of the 1 per cent breakage may not be due to variations in weld quality.

When checking tensile strengths of properly made flash welds in low carbon steel strip, it has not been possible to get the break to occur in the weld. Almost always it breaks in some portion of the strip adjacent to the weld. It does not consistently break in one place with reference to the weld, which indicates that heating has not lowered the strength in adjacent zones. If the original strip material fractures at 50,000 pounds per inch in tensile tests, the ultimate strength of the welds falls within the same bracket of breakage as the strip stock.

The demand of the steel industry for continuous lines is rapidly expanding the application of resistance flash welding.

Top is front view and bottom is back view of a welded strip showing results of "bubble" tests. In each case, the test at left end is in a weld over which the trimmer blades have made a light cut, clearly showing fracture due to effect of too close trimming. Center test in each shows a weld trimmed properly with no fracture. Tests at right are in the unwelded sheet





The Influence

Of American design is quite evident in construction of new blast furnaces and steel plants in Europe. It is most visible in continuous rolling mills making strip steel, sheet and tinplate products

■ AMERICAN design has been prominent in the recent developments of German blast furnace and steel plants. Germany is today the largest producer of iron and steel in Europe and concentrates production on large units. Among latest developments, H. A. Brassert has been engaged by the German government to design the new blast furnace and steel plants of the Reichswerk Hermann Goering. He also is actively engaged in other continental countries, particularly in central and eastern Europe. In Great Britain, the well-known Corby works, set up by Stewarts & Lloyds, Ltd., in 1934-35 for the making of basic bessemer steel, were also designed by Mr. Brassert.

Resembles American Mill

The first continuous hot-rolled strip mill on the continent was built at Dienslaken, Germany, by the German United Steel Co. This plant in every respect resembles a modern American strip mill and was built with the co-operation and sponsorship of American Rolling Mill Co., Middletown, O. The three slab-heating furnaces are of Rust design, built by their German licensee. The hot strip mill is of American "Mesta" design, built by DEMAG, also responsible for the design of the auxiliary equipment for hot-rolled strip.

The cold-rolled strip for tinplate is further processed at the plant of a subsidiary company in Wissen, Germany. The equipment is of American design and consists, among other things, of the following: Two single strands of 4-high reversing cold mills with driven working rolls and high-tension reels on both sides. (These mills were built by DEMAG.) A Meaker electrolytic degreasing unit for degreasing the cold-rolled strip before annealing and eventual tinning, built by the German licensees of the Meaker Co., Chicago. Lee Wilson Engineering Co., Rocky River, Ohio, hood-type annealing furnaces have been installed for annealing. Other auxiliary equipment, such as cut-off machines, etc. all follow along the lines of American design.

This is known as one of the most modern tin mills in Germany. In addition to making cold-rolled strip of the hot-rolled strip from Dienslaken, hot-rolled tinplate also is made on conventional 2-high hot tin mills from breakdowns furnished by Dienslaken. Here, too, we find two American walking-beam type open annealing and normalizing furnaces for the black annealing of tinplate. Eventually, all the white or second annealing will take place in Lee Wilson type furnaces. Also, here are continuous pack-heating furnaces of the walking-beam type.

American Design in England

In Great Britain, the principal tinplate mills in South Wales are of American design. Among latest developments is a fully mechanized 3-high roughing mill built by Schloemann for the Wolverhampton Corrugated Iron Co. Ltd., Mersey Ironworks, Ellesmere Port, Cheshire. John Summers & Sons Ltd., of The Wellman Smith Owen Engineering Corp. Ltd., manufactures in England all specialties of the Wean Engineering Co., Warren, O., such as catcher tables and other auxiliary machinery for sheet and strip mills.

The cold-rolling of automobile sheets from wide hot-rolled strip takes place in Germany at a plant known as Eichener Walvewerk, near Siegen, a subsidiary of the United Steel Co. The cold mill, a 4-high unit, was built by DEMAG. Here it is well to note that this plant was the first German sheet mill to adopt the American loose-rolling method of making automobile sheets and also the first to build a normalizing furnace in Germany. This latter furnace was of the American-Kathner design. Later continuous pack-heating furnaces, 3-high hot-roughing mills, and pickling and scrubbing machines of American design were installed.

For the manufacture of automobile sheets from hot-rolled strip, coils will be furnished to this plant by the Dienslaken mill, while cut-to-length breakdowns also are taken from the hot-rolled strip made at Dienslaken, will be used on the conventional 2-high sheet mills.

Hoesch Steel Works, Dortmund: In this plant there is in course of construction the first European so-called Steckle reversing hot mill with the hot-coiling furnaces at both ends. This installation was built by Krupp-Grusonwerke, licensees of the Cold Metal Process Co., Youngstown, O. The unit will be in operation within the next few months.

The slabs will be heated in Rust Furnace Co., Pittsburgh, slab furnaces. The cold-rolled strip will be degreased in a Meaker electrolytic cleaning machine built by the German licensees, and much of the

(*Please turn to Page* 81)

The accompanying article sets forth observations by an American steel works engineer, resulting from a recent tour of European iron and steel plants

Shotton, Chester, are building a wide strip mill of Mesta Machine Co., West Homestead, Pa., design. American specialists are engaged here as well as at Ebbwvale for constructing and placing these mills in operation.

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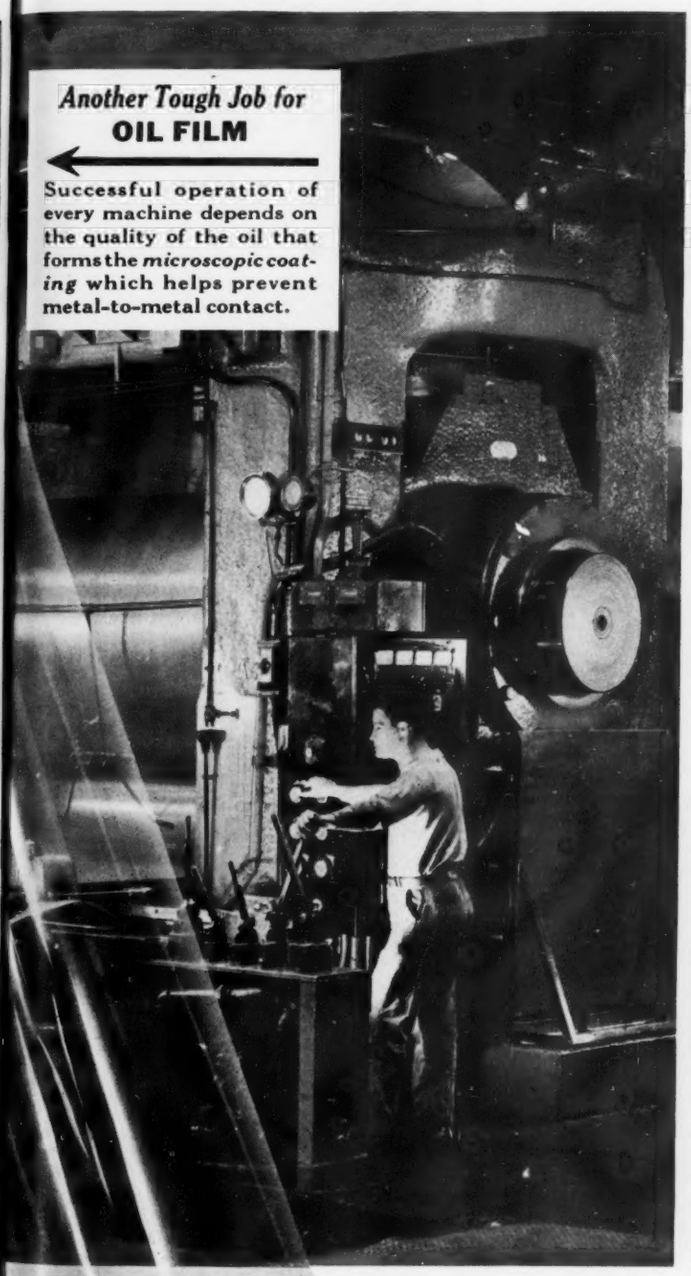
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Cash-Register

And accounting-machine manufacture involves huge handling problem in production, storage, subassembly and assembly of 480,000,000 parts yearly. Unique conveyor and power-truck system carries pieces in stock boxes through departments in 26 buildings

■ MANUFACTURE of cash registers and accounting machines at National Cash Register Co., Dayton, O., involves a tremendous handling problem. Even the smallest register requires some 1500 pieces, and larger machines may employ as many as 12,000.

In addition to the sheer volume of parts required for a single completed cash register, these machines are made in a number of different models, sizes and designs to handle requirements of various business transactions, necessitating yet more pieces. In addition 40 per cent of the total number of different parts carried in stock constitutes only 0.3 per cent of the total pieces used. This means that almost half of the different parts are used in fewer than one out of a hundred registers. As far as possible, registers are designed to use the same pieces in various types of machines.

Large Stock Necessary

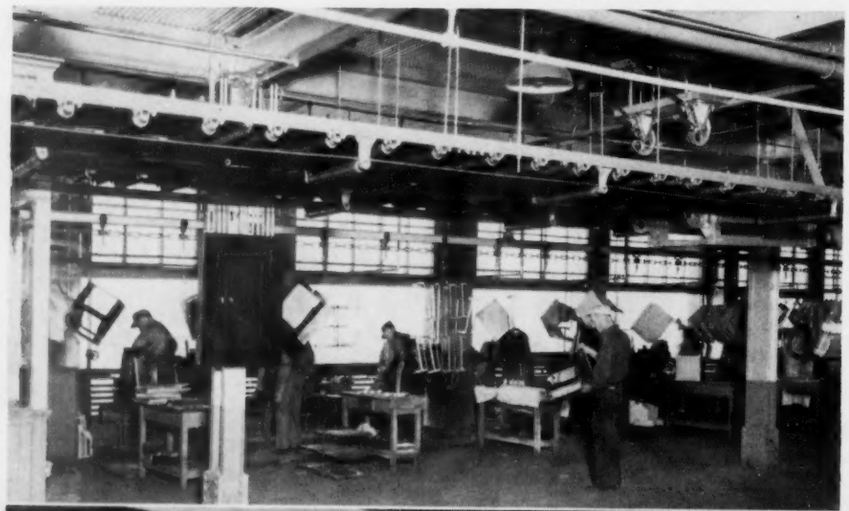
This situation involves a manufacturing problem in that to assure reasonably low cost, those parts used infrequently must still be produced in fairly large quantities. Result is that it is necessary to maintain a large stock of parts and subassemblies. At this plant more than 70,000 different parts are carried in stock. Main supply stock rooms number 23. In addition many departments have their own stock rooms carrying parts for subassemblies.

Although National Cash Register Co. makes about 10 basic models of machines, these have innumerable variations. A year's production involves some 200,000,000 pieces of screw machine parts alone. Total pieces required per year number around 480,000,000.

To handle this huge volume of pieces through production, storage, subassembly and final assembly, a unique system is employed. It is outstanding for its flexibility and completeness. This system serves 26 different buildings with an area of 50.8 acres of floor space. Buildings range in size from 1 to 11 floors with adequate mechanical handling facilities serving all floors of every building.

Manufacturing Localized

It will be seen from Table 1 that manufacturing operations are confined to certain areas to simplify operations as far as possible. For instance, building No. 2 is given over mostly to assembly work; building No. 3 to finishing operations such as enameling, plating and polishing; building No. 4 to assembly and in-



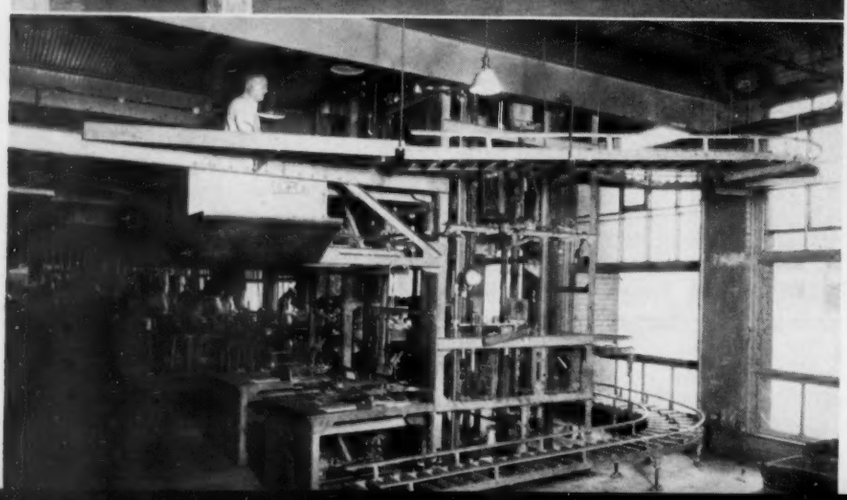


Fig. 1 (Upper)—Boxes travel from building to building on the two overhead belt conveyors shown here. Many chain conveyors such as the one shown near the windows are used in production work throughout the plant

Fig. 2 (Lower)—Dispatching station where boxes are routed to and from various buildings. Also shown are loading and unloading stations for the two vertical automatic elevators which serve this location

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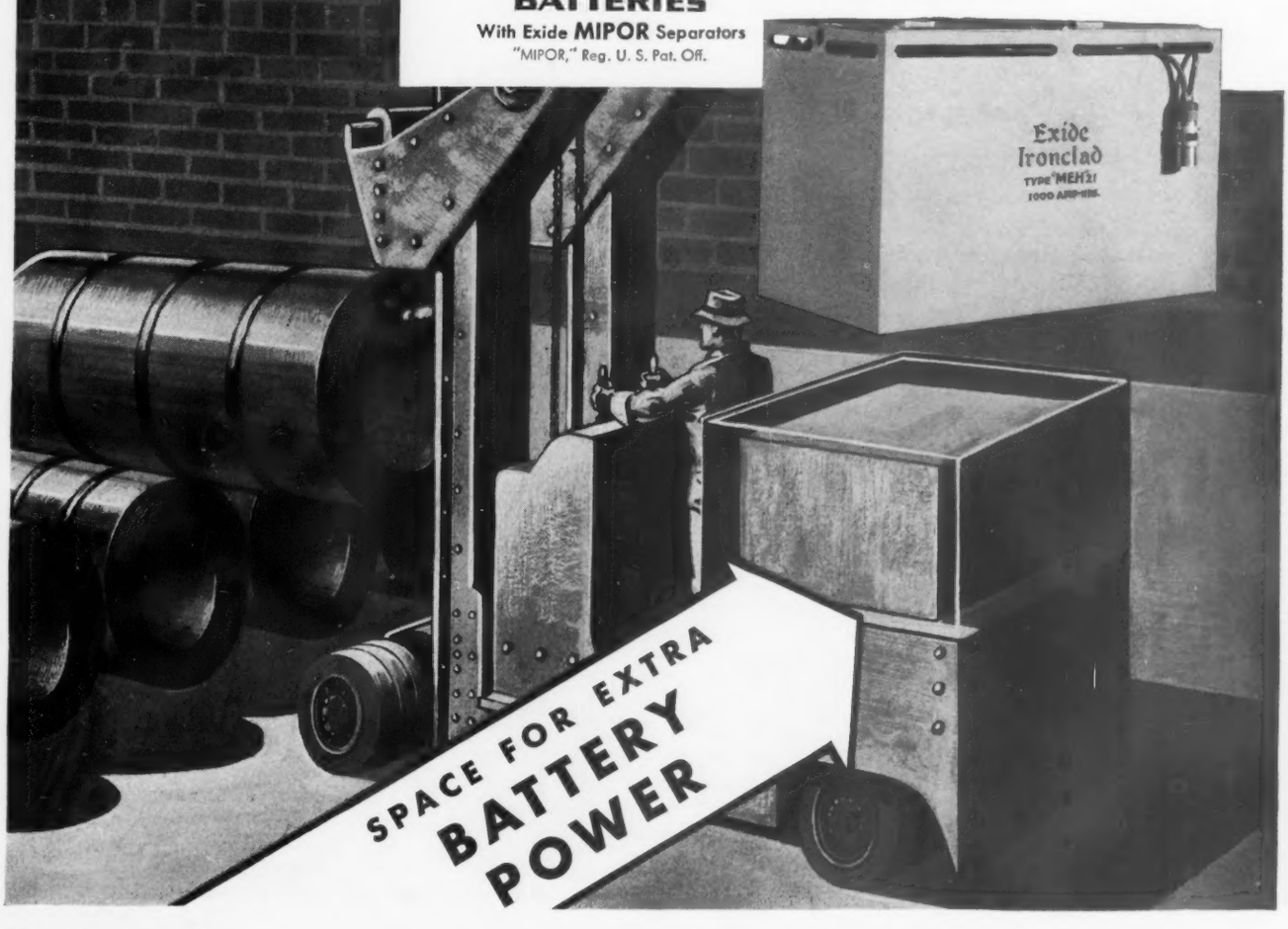


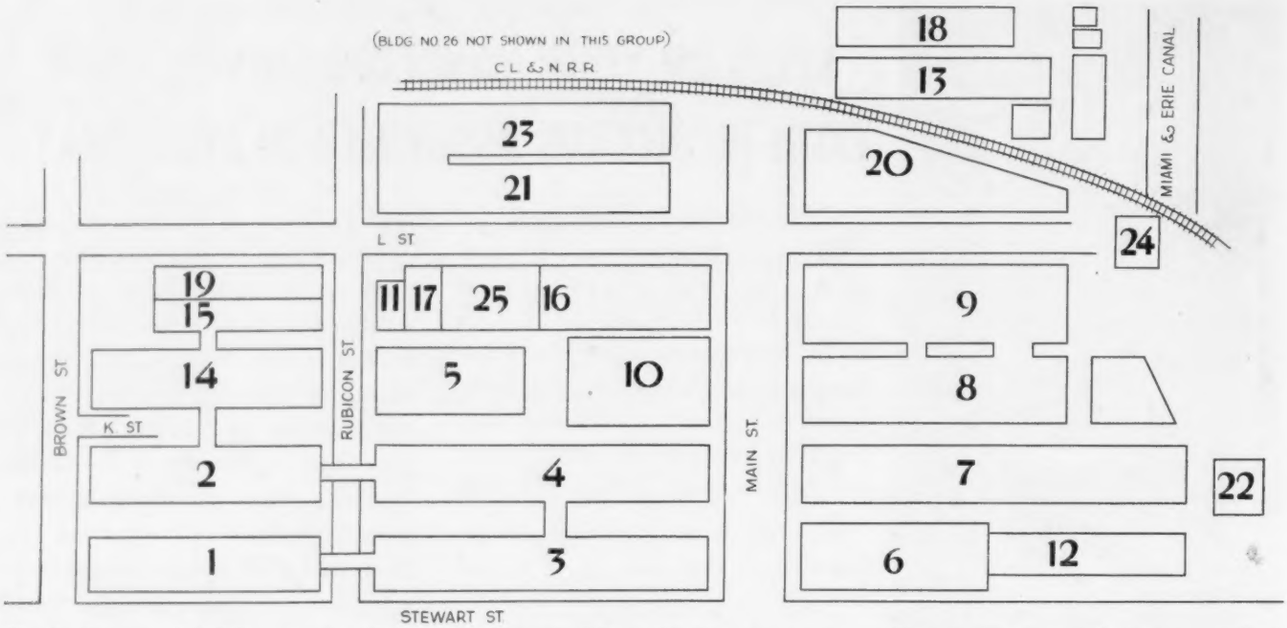


Fig. 3—Layout of buildings at the National Cash Register plant, Dayton, O. See Table I for departments in these buildings, building numbers correspond to those shown here

spection; building No. 5 to generation of power; building No. 6 to asembly; etc.

Since most parts and subassemblies are comparatively small in size, they lend themselves to handling in trays or tote boxes. About 113 different types of trays and boxes are employed. Standard size is 17 x 21½ x 6 inches, the latter dimension being the one which varies mostly. This is the height. All

Table I

Building No. 1

Basement, Stockroom
1st Floor, Assembly
2nd Floor, Assembly
3rd Floor, Indicator and Stockroom
4th Floor, Laundry and Drilling

Building No. 2

Basement, Transportation, Milling and Stockroom
1st Floor, Milling
2nd Floor, Assembly
3rd Floor, Supervisor of Machining, Chief Inspector, Chief Clerk, and Inspection
4th Floor, Assembly
5th Floor, Assembly

Building No. 3

Basement, Stockroom and Inspection
1st Floor, Frame
2nd Floor, Assembly
3rd Floor, Plating and Inspection
4th Floor, Enameling
5th Floor, Polishing and Plating

Building No. 4

Basement, Inspection, Stockroom and Cutoff Room
1st Floor, Traffic and Receiving
2nd Floor, Final Inspection and Packing
3rd Floor, Stockroom
4th Floor, Assembly
5th Floor, Assembly

Building No. 5

Power Plant

Building No. 6

Basement, Stockroom
1st Floor, Assembly
2nd Floor, Assembly
3rd Floor, Assembly

Building No. 7

Basement, Woodworking
1st Floor, Woodworking
2nd Floor, Wood Cabinet
3rd Floor, Toolmaking
4th Floor, Toolmaking and Tool Inspection
5th Floor, Finishing and Tool Designing

Building No. 8

Foundry, Pattern Shop, Special Machining and Die Casting

Building No. 9

Traffic (Returned Registers), Inspection, Stockroom, Carpenter and Paint Shop

Building No. 10

Basement, Window Display and General Service
1st Floor, Lobby, Display Room, Purchasing, Welfare, Medical, Library, Employment and Post Office
2nd Floor, Chief Engineer, Construction and Model Making
3rd Floor, Research and Testing
4th Floor, Engineering
5th Floor, Payroll Cost, Vice President of Production, Plant Engineer, Stock Ordering, Standards Superintendent and Equipment Engineer
6th Floor, Treasurers, Cashier and Sales Service
7th Floor, Ordering and Treasurers
8th Floor, Sales Division and Advertising
9th Floor, Executive Offices, Overseas, Legal, Patent, Executive Dining Room and Future Development
10th Floor, Sales Demonstration Rooms, Meeting Room and Office Service
11th Floor, Executive Treatment and Photography

Building No. 11

Basement, Stockroom
1st Floor, Stockroom

Building No. 12

Dry Kiln

Building No. 13

Basement, Stockroom
1st Floor, Outside and Garage

Building No. 14

1st Floor, Punch Press
2nd Floor, Screw Machines
3rd Floor, Drilling and Screw Machines
4th Floor, Screw Machines
5th Floor, Assembly and Special Machining
6th Floor, General Machining and Special Machining (Plastic Mold Section)

Building No. 15

1st Floor, Heat Treating and Stockroom
2nd Floor, Pyrometer Room, Tin Shop and Storage

Building No. 16

Basement, Projection
1st Floor, Auditorium

Building No. 17

Basement, Manufacturing Laboratory
1st Floor, Manufacturing Laboratory

Building No. 18

Basement, Repair Supply, Repair School and Model Register Storage
1st Floor, Repair Supply, Repair School

Building No. 19

Electrical, Stockroom, Plumbing and Millwright

Building No. 20

Stockroom and Punch Press

Building No. 21

Printing and Stockroom

Building No. 22

Locomotive House

Building No. 23

Order Supply, Stockroom and Slitting

Building No. 24

Acetylene Generator House

Building No. 25

1st Floor, Employees' Dining Room
2nd Floor, Commissary Kitchen and Stockroom

Building No. 26

Basement
1st Floor, Schoolhouse
2nd Floor

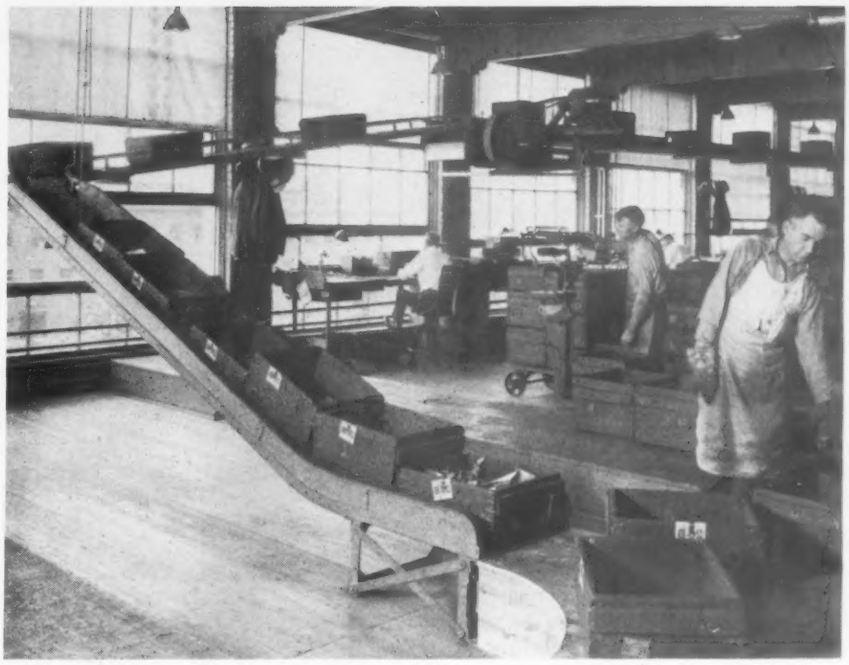


Fig. 4—Often stock boxes are carried to a far end of a floor or department on overhead belt conveyors and delivered where wanted as shown here. Tags on boxes show dispatchers where to send the material

boxes are of wood reinforced with malleable iron corners. More than 110,000 stock boxes, or tote boxes, are employed in handling and storage. A large number of them are used in stocking parts which have a comparatively rapid turnover, thus eliminating necessity of placing into and removing from storage bins.

Parts stored in bins constitute a large percentage of the annual production. After being manufactured, the parts go to stock or storage area in subassembly department. After subassembly is completed, the subassemblies are moved to the stock room serving the main assembly areas. Since there are a number of subassembly as well as main assembly points, stock is maintained at more than 23 stations in addition to the departmental and subassembly storage areas. Total bin storage available totals 25,842 linear feet, almost 5 miles.

Combination of Systems Used

Stock boxes are transferred by combination of conveyor systems, elevators and power trucks. The conveyor and elevator systems are supplemented by a system of tunnels connecting buildings at basement level. The tunnel system includes a long tunnel serving all the buildings on the west side of Main street; that is, buildings numbered 6, 7, 8, 9, 20 and 13, Fig. 3.

On the opposite side of Main street, a tunnel connects buildings numbered 3, 4 and 10; another tunnel connects buildings 2, 3, 4 and 14; and yet another tunnel connects buildings 1 and 2. One cross interconnecting tunnel joins buildings 4 and 7, and crosses under Main street. By means of this tunnel system it is possible for power trucks to transfer material between any two main buildings underground at basement level, entirely independent of weather conditions.

Power trucks include 43 electrically driven 2-ton units and 30 smaller units rated 300 pounds each. The large trucks haul tote boxes in stacks, completed cash registers and raw material. The small trucks are used in transferring lighter orders from stock rooms to assembly areas and in similar operations.

Another interesting use of the light trucks is for intraplant mail service. Two trucks and operators are in service continuously traversing regular routes throughout the plant in opposite directions. This affords a complete mail service between any two points in the plant in not over 2 hours and 45 minutes, the time necessary to make a round trip. Of course, most transfers do not necessitate a complete trip and so are made in much shorter time. The two trucks meet and exchange mail at two places on the route. Fifty-one discharge and pick-up points are served.

Conveyor system is interesting not only because of the extremely large volume of material handled, but because of the unique system employed for routing the material. The conveyors carry 2,750,000 stock boxes per year, approximately 1800 per hour. There are 3½ miles of gravity roller conveyor; 1¾ miles of chain conveyor; 3 slat conveyors; one 30-degree pushbar booster; and 54 belt conveyors, 20 inches wide, making a total of 8½ miles of belt conveyor. In addition, there are five double vertical automatic elevators and one single vertical unit serving six floors in building No. 14 and five floors in buildings No. 1, 2, 3, 4. Some 60 air hoists are employed at various places to lift stock boxes from working station level to the belt level, which is just below the ceiling.

Stock boxes with contents weigh not over 100 pounds each and usually average about 60 pounds.

Each of the main buildings used for manufacturing and assembly work contains a vertical lift which operates in conjunction with the

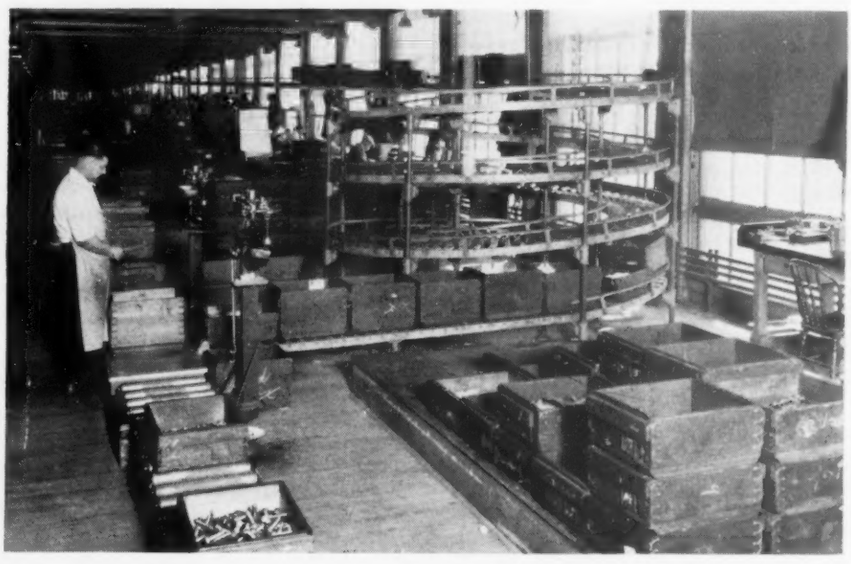


Fig. 5—This spiral conveyor combines a delivery point with space to store a large number of boxes

Fig. 6—Drying ovens also employ many chain conveyors as shown here

belt conveyor system. Buildings numbered 1, 2, 3, 4, 14 and 15 are interconnected with bridges. At third floor level, a belt conveyor connects these buildings to permit transfer from building to building. These 20-inch belt conveyors are located near the ceiling so do not interfere with free movement of material in aisles at floor level.

Fig. 1 shows belt conveyor traversing an aisleway in one of the portions of the finishing department. The stock boxes ride on top of the belt conveyor. In this photograph it will be noted there are two belts. The two belts go in opposite directions, thus permitting transfer of material in both directions at the same time. This is the system followed in all interconnecting conveyors between buildings. Speed of these belts will average about 57 feet per minute.

Conveyors Go Through Dispatcher

In each of the main buildings, the belt conveyors go straight through to a dispatching point. There are a total of 125 pickup and dispatching points in the belt conveyor and elevator system. Each station has a code number, and boxes are addressed to the desired station by a card clipped onto the outside. Some of these cards are visible in Figs. 4 and 5.

Fig. 2 shows one of the main switching stations at the third level in one of the buildings. At these main dispatching points, boxes are not only transferred to the correct conveyor to take them to other buildings if this is desired, but they also are set on the elevators which take them to the various floor levels in the building. On some floors elevators discharge to a conveyor carrying the stock boxes to that portion of the floor where they are wanted.

Fig. 4, for instance, shows discharge end of a belt conveyor where stock boxes have been carried to the department desired at ceiling level and then allowed to drop to working level on a section of gravity roller conveyor. Fig. 5 shows another type of roller gravity section which also serves as a storage conveyor. This spiral unit contains a considerable length of gravity roller conveyor. It discharges on a table permitting transfer to other sections of roller conveyor as shown.

An interesting feature of this system is the dispatching station at third floor level where belts connecting buildings terminate. One of these stations is shown in Fig. 2. Here the dispatcher shown in the small booth near ceiling level directs transfer of boxes from one building to another as well as sending them to the correct floor level in the building in which he is located. Just below the operator is seen the pickup and delivery station for the elevator at this same floor.

Elevators are entirely automatic as far as pickup and discharge are concerned. At the station shown in Fig. 2, there are two vertical elevators and thus two pickup and discharge points at each floor level. The two tables seen directly underneath the operator's booth are the pickup points from which stock boxes are placed in the elevating mechanism. If a box is merely to be transferred to another floor in the building, it does not need to have a card to indicate the station number as the elevator is set to discharge automatically.

There is a lever at the pickup point which the operator sets to the

(*Please turn to Page* 83)

New Copper Alloys

■ Chase Brass & Copper Co., Waterbury, Conn., is introducing two new tellurium copper alloys which are said to be particularly adaptable for forgings and screw machine products.

Type A, analyzing 0.5 per cent tellurium, balance copper, offers the combined properties of conductivity, forgeability and machinability. It may be hot worked within or even beyond the broad range of 1200 to 1600 degrees Fahr. or extensively cold worked, although at room temperature it is somewhat less ductile than copper. It machines 25 to 50 per cent faster than some other types of free-cutting alloys. Electrical conductivity is not quite equal to that of copper. Corrosion resistance and color are approximately the same as for commercial copper.

Type B, analyzing 0.5 per cent tellurium, 1.00 per cent nickel, 0.2 per cent phosphorus, remainder copper, presents about the same physical properties as type A but with the outstanding difference that it may be strengthened and hardened by heat treatment. Yield strength may be increased from 10,000 pounds per square inch to about 40,000 pounds and Rockwell F hardness from 50 to about 90 by one simple heat treatment.

Publications Available

■ From Ferro Enamel Corp., 4150 East Fifty-sixth street, Cleveland, "Errors in Reflectance Measurements of Porcelain Enamel Surfaces," being technical bulletin No. 3.

From American Society for Testing Materials, 260 South Broad street, Philadelphia, "The Theory of Impact Testing: Influence of Temperature, Velocity of Deformation, and Form and Size of Specimen on Work of Deformation," which is a reprint in pamphlet form from the copyrighted proceedings of the society.

From Ohio State university, Columbus, O., engineering experiment station bulletin No. 102, "Settlement Stresses in Continuous Frames," price 40 cents.

From superintendent of documents, Washington, national advisory committee for aeronautics report No. 670 "Tensile Elastic Properties of 18:8 Chromium-Nickel Steel as Affected by Plastic Deformation," price 15 cents, and national bureau of standards research paper RP1221 "Rate of Oxidation of Steels as Determined from Interference Colors of Oxide Films," price 10 cents.

ADVERTISING PAGES REMOVED

Importance of Pyrometry to Metal Industries Stressed at Symposium

■ ADVANCES in pyrometry in recent years were reviewed at a symposium on temperature, its measurement and control in science and industry, held in New York, Nov. 2-4, under auspices of the American Institute of Physics, with co-operation of the national bureau of standards and National Research council and 12 other scientific and engineering organizations.

Broadest in scope of any symposium on the subject ever held, the meeting was featured by a program of more than 125 papers, contributed by engineers, metallurgists, chemists, physicists and others. The fundamental importance of temperature and its control to nearly all technical fields, a fact which was first recognized at a symposium on pyrometry held 20 years ago, came in for special emphasis.

This importance in its relation to iron and steel, and alloys and nonferrous metals was stressed at several sessions, with notable progress indicated in both equipment and technique, but with the need still evident for greater attention to the subject by technical schools.

A feature of the program was a banquet at which M. E. Leeds, president, Leeds & Northrup Co., Philadelphia, delivered an address entitled "Some Incidents of Early Industrial Pyrometry in the United States." Other principal speakers were Dr. F. K. Richtmyer, editor, *Review of Scientific Instruments*, New York, whose subject was "Instruments: The Basis of Progress," and Dr. Vilhjalmur Stefansson, Arctic explorer, who spoke on "How Primitive People Adjust to Low Temperatures."

Temperature of Liquid Metal

Discussing the pyrometry of liquid metals and of the blast furnace, G. R. Fitterer, University of Pittsburgh, and the Fitterer Pyrometer Co., Pittsburgh, spoke first of the measurement of the liquid metal temperatures by means of immersed thermocouples. Several older thermoelectric devices which had been redesigned and suggested recently were critically discussed together with the author's carbon-versus-silicon carbide thermocouple.

He outlined certain difficulties in the application of the C-SiC thermocouple and presented the service record of one, which had been in daily use for more than 2 years for determination of the temperature of low carbon steels in 40-ton ladles. He then described the application of one of these couples to iron blast furnace runners, a unit which had been in service for about a year.

L. O. Sordahl, United States Steel Corp., New York, discussed pyrometry of liquid steel in the open hearth furnace, in which he presented a comparison of six methods for measuring temperature, using an immersed platinum thermocouple as the standard. Most promising of these methods, that of the Collins-Oseland tube, has been further developed as an automatic photoelectric recording instrument, he said.

The two best instruments for high temperature measurement are the platinum thermocouple and the optical pyrometer, when used under black body conditions, according to F. H. Schofield and A. Grace, National Physical Laboratory, England, in a paper on quick-immersion technic for high temperature measurement on fluids. The problem of applying either of these instruments, it was said is largely one of the refractory material employed for the sheath or sight tube.

Refractory Sheaths Costly

The current practice of increasing the heaviness of the sheath or tube with rising temperature has the following disadvantage: (1) The long time required for preheating to avoid fracture of the sheath and for attaining equilibrium on immersion; (2) the risk of damage to the sheath in the bath, particularly from any slag or flux; and (3) danger of contamination by reducing gases.

These points, together with the high cost of refractory sheaths have rendered impracticable the use of the two instruments for routine measurements on fluids such as steel at high temperatures, it was said.

The quick immersion technic, enabling the platinum thermocouple to be used for regular measurements on liquid steel up to a limit of 1700 degrees Cent. consists essentially in lightly sheathing the couple in silica, thus allowing its sudden immersion in the steel, the taking of readings in a few seconds, and withdrawal of the couple intact.

Where the steel is covered by slag, as in the furnace or ladle, the small silica sheath, which costs only 25 cents, must be replaced after each insertion. However, the sheath, it was pointed out, will survive a number of insertions in the launder or trough streams, and in all cases, the couple will stand from 10 to 20 immersions without appreciable contamination, and the full electromotive force can readily be restored by cutting off an inch or two from the heated end. The time taken to get a reading ranges from 4 to 15 seconds, according to circumstances.

Outlining the technic partially developed for the optical pyrometer, the authors discussed possible modifications.

John Chipman, Massachusetts Institute of Technology, Cambridge, Mass., discussed some new measurements of the melting point of iron and ferrous oxide.

C. B. Post, metallurgical department, Carpenter Steel Co., Reading, Pa., discussed informally the emissivity corrections to be applied to liquid steel. Experiences in basic electric furnace practice, he said, would lead one to suspect that a different emissivity correction than 0.4 should be used by open hearth producers on reading tapping temperatures if a correction of 0.4 is used by steel producers who tap fully killed steels. This is the experience of melters who have to judge the temperature of both "wild" and "killed" steels, he declared.

To be explicit, Mr. Post said he had in mind a type of basic electric furnace steel of low alloy and medium carbon content which is kept in an oxidizing condition until about an hour before tap. The deoxidizers are added after the slag is partially turned reducing and the heat tapped. Temperature of the metal in the oxidizing period will appear very hot, that is, a temperature of 1600-1610 degrees Cent., but after the deoxidizers are added to give a killed steel, the temperature will be judged and read by the optical pyrometer when tapping to be in the neighborhood of 1570-1580 degrees Cent.

Tapping Temperature High

Thus the speaker indicated that the emissivity of wild steel is closer to that of a black body than killed steel. Furthermore, he said, it is a well-known fact that basic electric furnace practice, using small ladles and small ingot molds appropriate to 11 tons, yields relatively hot steel; and as previously brought out at the meeting he stated a hot temperature for killed low carbon basic electric steel at tap is about 1600-1610 degrees Cent., using the emissivity correction of 0.4.

Melters who have melted steel in both open hearth and basic electric furnaces would agree, Mr. Post believed, that if killed steel, which taps at 1600-1610 degrees Cent. should be raised up to 1640-1660 degrees (as is frequently reported for tapping temperatures in the open hearth) no ordinary nozzle or stopper rod would be able to hold this steel in the ladle. The appearance of a furnace not especially adapted for high temperature work (such as the furnaces used to make stainless

steel from chrome ore) after being subjected to temperatures of 1640-1660 degrees Cent.) would be an interesting sight, he added.

The foregoing remarks can be taken to mean that open hearth and basic electric furnace tapping temperatures are approximately the same; however, Mr. Post said, the difference arises due to the open hearth tapping tetmperatures being obtained on wild metal (emissivity coefficient expected to be greater than 0.4) while the basic electric tapping temperatures are obtained on killed steels (emissivity almost 0.4 as determined by the national bureau of standards in 1920).

Urges Question Be Studied

It was suggested that appropriate technical committees of metallurgical societies consider this question and if it is decided that the problem is real, to attempt to find this difference in emissivity constants for wild and killed steels so that steelworks metallurgists can discuss temperature effects referred to a standard scale. The thermocouples of Fitterer, if they have the accuracy claimed, or the type of "quick immersion" thermocouple developed by the British Iron and Steel institute would serve admirably for this purpose of standardization, Mr. Post concluded.

At the general engineering session, H. F. Mullikin, Babcock & Wilcox Co., New York, described recent developments in gas temperature measurement, as well as certain other of the older methods. He also discussed the instruction and use of a high velocity thermocouple assembly designed to facilitate obtaining temperature readings and keeping the apparatus in repair even when operating under such adverse conditions as are met with in the furnaces of pulverized coal fired boilers.

The theory of high velocity thermocouple is simple, he stated. An ordinary thermocouple junction inserted in a furnace or duct carrying high temperature gases under ordinary conditions "sees" walls whose temperature is different from that of gas. Where these walls are "cold," boiler tubes, for instance, the thermocouple junction, although but a few hundredths of an inch in diameter, will radiate heat to this colder surface and will thus be cooled below the temperature of the surrounding gas. The resulting error may, at furnace temperature, amount to several hundred degrees.

However, this difficulty, he said, may be overcome to a considerable extent by the use of the high velocity thermocouple (usually denoted HVT), which has a heat-insulating shield, or "radiation-shield," around the tip of the thermocouple junction, so that it will be able to "see" only a small portion of the cold walls.

A stream of hot gases is then aspirated past the junction of the thermocouple at high velocity. This further increases, it was stated, the convection heat transfer from the gas to the thermocouple tip, thereby causing the reading to approach the true gas temperature.

The author also presented some empirical data to indicate the magnitude of the temperature measuring errors that may be expected in steam-boiler practice and in equipment operating under similar conditions.

Mr. Mullikin and W. J. Osborn, also of the Babcock & Wilcox Co., presented a paper which discussed accuracy tests of the high velocity thermocouple. Apparatus, it was said, was constructed and set up in the laboratory so arranged that the true gas temperature in a 4-inch square test section could be obtained by means of specially constructed temperature-measuring sections before and after this test section. Readings of a single-shield high velocity thermocouple, a multiple-shield high velocity thermocouple, and various sizes of ordinary bare thermocouples were compared.

P. H. Dike, Leeds & Northrup Co., Philadelphia, outlined a course in temperature measurement, which his company installed for the training of salesmen and engineers. The course extends over a period of from nine months to a year and covers thoroughly the electrical and radiation methods, together with a less detailed study of other branches of instrumentation. A definite plan of study, lectures, experiment and mechanical work on instruments under competent direction is followed. The results have proved gratifying, Mr. Dike declared, and it was his belief that the subject deserves more attention in engineering schools.

Two Types of Pyrometrists

Robert B. Sosman, United States Steel Corp., New York, said that the industrial plant needs pyrometrists of two types. One is the research man, skeptical of the misinformation supplied by industrial instruments as usually installed and maintained, and capable of extracting the truth from their readings and of devising ways to obtain more truthful indications and records and also to obtain more faithful and intelligent control from pyrometric devices. Fundamental training in mathematics and physics, necessary for this type of pyrometrist, may be wholly wasted on the second type, whose main interest is to keep the machines operating in something approaching satisfactory style.

At a session devoted to nonferrous metals and ceramics, C. L. Mantell, consulting chemical engineer, New York, dealt with pyrometric problems and temperature measurement in tin smelting, alloy preparation and fabrication of tin-containing materials, with a discussion of the preparation of "standard tin" for use as a melting point reference standard.

Cyril S. Smith, American Brass Co., Waterbury, Conn., said that quantitative heat measurements cannot be obtained from the cooling or heating curves customarily made for the determination of critical points in metals, since the rate of heat transfer varies with amount of heat evolved or absorbed. He described a new method in which the specimen is placed in an insulating or refractory container across which a constant temperature gradient is maintained by a differential thermocouple and an automatic temperature controller.

Heat Transfer Varies

Heat flow to the sample depends, he said, only on the constancy of the container, which may be determined by the use of a standard sample of known specific heat. The time taken to cool or heat through a given temperature interval is directly proportional (after a blank correction) to the heat capacity of the sample, and the duration of an arrest is directly proportional to the latent heat. The apparatus is simple to construct and use, but it is necessarily inapplicable to non-metals because of their low thermoconductivity. The device also provides a simple means of controlling rates of heating or cooling of any furnace, Mr. Smith said.

A new two-color optical pyrometer was described by H. W. Russell and C. F. Lucks of the Battelle Memorial institute, Columbus, O., and L. G. Turnbull, Canadian National Research council, at a session devoted to optical pyrometers. Declaring that the monochromatic optical pyrometer fails if either the emissivity of the source or the transmission of the intervening space is unknown or variable, the two-color pyrometer has been devised to obviate these difficulties when "gray" conditions are found to exist.

The radiation from the source is split into red and green beams; the ratio of whose intensities is dependent only upon the temperature of the source. These two colored beams, the authors declared, are received simultaneously by two photoelectric cells, and the ratio of the output currents provides a direct indication of the temperature. This current ratio is determined by Wheatstone network in which resistances of variable ratio are ad-

Stressproof News

T. M. REG. U. S. PAT. OFF.

Presenting News of a New Cold Finished Steel Bar

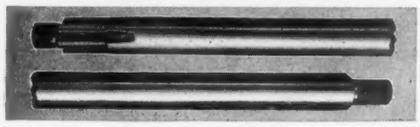
EXTRA! Leading manufacturer of a wide range of steel parts reports successful use of STRESSPROOF No. 2 Cold Finished Steel Bars in 7 applications. Savings per part are running from 38 cents to $1.50 each.

By LA SALLE STEEL COMPANY — **Chicago, Illinois**

GETS NEEDED STRENGTH, ELIMINATES TWO STEPS

Manufacturer of Power Take-Off Shafts Replaces SAE X-1340

A vital part of modern farm equipment is the power take-off shaft. The difficulties encountered in producing these shafts have been set down by a prominent manufacturer who conducted a series of tests on various



Two ends of Power Take-off Shaft (Center portion not shown)

grades of steel used in making the shafts.

The difficulties, he states, were two-fold. First problem was to produce a shaft of sufficient strength and wearability to assure trouble-free day-in-and-day-out service on farm jobs where delays in the middle of planting, harvest or other operations could be costly to users. The second was to produce such a shaft at lowest possible cost.

To meet those problems in making this shaft, cold finished SAE X-1340 had been used. But to develop the required strength and wearability and eliminate breakage, the shafts had to be heat treated in the spline section and the threaded ends which not only meant high costs but excessive rejections, warpage and difficult straightening operations. The same objection obtained with hot rolled SAE T-1345, heat treated after machining. And heat-treated-in-the-bar SAE-4140 meant mounting per part costs because of high initial cost and slow machining speeds.

Then, this maker goes on to say, STRESSPROOF No. 2 was tried. This steel, as received, was strong enough to meet the demands and possessed better wearing qualities than the heat treated after machining grades. And from a cost point of view, it settled definitely the question of what steel to use. The tests referred to show that elimination of heat treating and straightening meant considerable savings and showed that the high degree of machinability brought labor and tool costs far below that encountered with the other steels.

This experience with STRESSPROOF No. 2 has led the manufacturer to use it also in such parts as combine pick-up shafts, steering rods, flywheel bolts, tie rods, clutch shafts and spreader screws.

When Not to Use STRESSPROOF No. 2

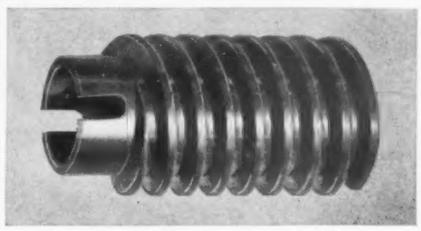
STRESSPROOF No. 2 by reason of its unique wearing qualities can be substituted for case carburized steel in many applications. It should be noted, however, that STRESSPROOF No. 2 has a Yield Strength of 100,000 lbs. p.s.i. minimum, and, therefore, is not suitable for parts case carburized and subjected to high unit pressures and severe Brinelling action.

Excellent Wearability Obtained *Without* Case Carburizing

Maker Says New Bar Steel Cuts Stoker Worm Costs $370 a Ton

A number of firms manufacturing parts for use in coal stokers are reported recently to have successfully eliminated several costly operations in the production of worms and shafts. Customary practice has been to carburize parts to obtain necessary wearability and then clean, straighten and grind.

Search for a steel that would permit elimination of costly case hardening and subsequent cleaning and grinding and which



COAL STOKER WORM STRESSPROOF Replaces SAE X-1315

would not warp led to a trial of STRESSPROOF No. 2 Cold Finished Steel Bars. When tests showed that this steel possessed *right in the bar itself* excellent wearing qualities without carburizing along with high strength, free machinability and minimum warpage it was adopted for a wide variety of stoker parts like drive shafts, stub shafts, shear pins, stoker pins, and gear shafts.

A typical example of the effect on costs when STRESSPROOF is used is supplied by the manufacturer of the stoker worm illustrated in column 2. This part, as formerly made of SAE X-1315, required carburizing, cleaning and grinding; rejections were numerous, and excessive warpage made straightening of many of the parts necessary. As now made of STRESSPROOF No. 2, carburizing, cleaning, grinding and straightening have been eliminated . . . and costs have been cut $370.00 per ton of steel used!

File Test Is No Standard For Measuring Wearability of STRESSPROOF No. 2

Although wear has been usually considered the result of hardness and a conventional test for hardness has been the file test, STRESSPROOF No. 2 obtains its wear values from structure rather than hardness and therefore is not file hard.

In the production of parts requiring abrasive resistance and high yield strength, the file test is important. But in the production of parts which are subject to sliding frictional wear such as worms, pins, bushings, water pump shafts, etc., results have shown the structural resistance of STRESSPROOF No. 2 to be satisfactory even though not file hard.

It's Ready

to help you cut cost of parts

New STRESSPROOF *Engineering Bulletin*

Tells where STRESSPROOF No. 2 Cold Finished Steel Bars fit into your program. Gives comparative cost data, based on actual production reports, on how "in-the-bar" qualities have reduced part costs by eliminating heat treating, case carburizing and other operations; by increasing machining rates; by minimizing warpage. Lists scores of successful applications.

Send for it! Attach coupon to business letterhead and mail.

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justed to give the zero potential between their outer terminals.

A survey of means for producing extreme temperatures being used in scientific and industrial work, was presented by Willi M. Cohn, University of California, Berkeley, Calif., at a conference on special theories and methods. Mr. Cohn discussed conditions for working at temperatures up to 3000 degrees Cent. for long periods. Data were presented for materials used in such work, including ceramic materials, elements, oxides, carbides and nitrides of high melting point. Methods of producing extreme temperatures for short periods of time were also discussed.

Small Changes Are Important

Accurate measurement of the flow rate of metals necessitates close measurement and control of the specimen temperature, because a change of as little as 6 degrees Cent. may double the rate of flow, according to H. F. Norton, Massachusetts Institute of Technology, Cambridge, Mass., in a paper entitled "Pyrometer in Connection with Creep Tests," at a session on automatic control and instruments.

He discussed the method of calibrating the thermocouples, of attaching them to the specimen and of adjusting the temperature distribution within desired limits. He also discussed a type of expansion temperature controller which, he declared, is simple and is inexpensive and yet gives accurate control of furnace temperature. A temperature regulation of plus or minus 0.1 degree Cent. can be obtained with this equipment, he said, provided the room temperature is well controlled.

A method developed for the purpose of simultaneously reporting several rapidly changing temperatures was described by A. R. Champion and G. K. Brokaw, University of California. The potentials generated by thermocouples imbedded in the test specimen are selected in sequence by constant speed rotating the switch and transmitted through ain amplifier of the flecting plates of a cathode-ray oscillograph. A permanent photographic record of the oscillograph deflection is obtained on a movie film. The recorded deflections are standardized by comparison with a known electromotive force, introduced at each revolution of the selector switch. Timing is accomplished by driving the selector switch at a known constant speed. The authors declared that by this process it is possible to record as many as 35 temperature measurements per second with an error of less than 2 per cent.

At a session devoted to thermometric metals and alloys, M. A. Hunter, Rensselaer Polytechnic institute, Troy, N. Y., discussed iron-nickel alloys suitable for resistance thermometry and in another paper, spoke of the relation of composition to electromotive force in alloys suitable for thermoelectric pyrometry.

Time and Motion Study Leads to Improved Efficiency, Lower Costs

■ LATEST developments in application of time and motion study were discussed by more than a thousand executives, plant managers, shop supervisors and industrial engineers, who attended the Industrial Management society's second annual time and motion study clinic in Chicago, Nov. 3-4. Attendance was about 25 per cent higher than at the first clinic sponsored by the society last year.

Walter L. Daykin, assistant professor of commerce, State University of Iowa, Iowa City, Iowa, discussed labor's attitude toward cost reduction work, giving also practical suggestions as to how management can improve its relations with the man on the job. Use of time and motion methods, it was pointed out at the clinic, is not a form of industrial speed-up but rather a method of increasing labor's efficiency while minimizing human fatigue. A. B. Segur, president, A. B. Segur & Co., Oak Park, Ill., discussed motion study from the human angle outlining how engineers can lead the way to a new concept of industrial economy.

A great deal of misunderstanding existing between time study and the shop is the failure of the time study man to sell himself to the shop foreman and many time study engineers have failed in their work merely because of this, it was pointed out by E. L. Berry, assistant general manager, Link-Belt Co., Pershing Road plant, Chicago. A. H. Mogensen, industrial consultant and consulting editor, *Factory Management & Maintenance*, New York, described how work simplification may be employed to search out the hidden losses that have stood in the way of increased production and greater manufacturing economies and how this may be done without decreasing wages.

R. E. Green, B. F. Goodrich Co., Akron, addressed the clinic on the subject of leveling the time study. There is a wide diversity of opinion, Mr. Green brought out, regarding the proper methods to be used in making a rating of time study and in establishing task standards based on these studies. Mr. Green described some of the methods now being used and also presented in detail a workable method of time study rating which has proved its practicability over a long period of time.

Many establishments have employed time study for rate setting for a number of years but relatively few have given thought to the benefits to be derived through motion analysis as a tool for eliminating wasteful motion. Harold B. Maynard, president, Methods Engineering council, Pittsburgh, and co-author of books *Time and Motion Study* and *Operation Analysis*, told how such companies might proceed in getting a motion study program started and how to detect bad motion process in their manufacturing processes.

Determining Proper Schedules

Time study cannot be an exact science because the rate of individual time study to obtain the normal average performance requires the use of judgment on the part of the time study analyst himself. Phil Carroll Jr., vice-president, Dyer Engineers Inc., Cleveland, pointed out how and why mathematical formulae as applied to leveling time studies have failed in actual practice, but told in detail how standard times fair to worker and management can be most economically determined.

L. S. Whitson, industrial engineer, Minnesota Mining & Mfg. Co., St. Paul, pointed out it has been thought that motion study is one of the secrets of the engineer, but that this idea rapidly is being outmoded. The shop supervisor is in the best position to apply the principles of motion economy. Companies, by teaching shop supervisors motion economy principles, are finding that they can capitalize on the ideas of the men in the shop who have been responsible for a large percentage of the improvement in methods due to their contacts with the job.

Dr. Lillian M. Gilbreth, industrial consultant, Montclair, N. J., discussed the advantages of motion study to the individual worker, considering the employes' viewpoint.

More than a dozen exhibits of motion study equipment, laboratory apparatus and time saving devices were presented during the clinic.

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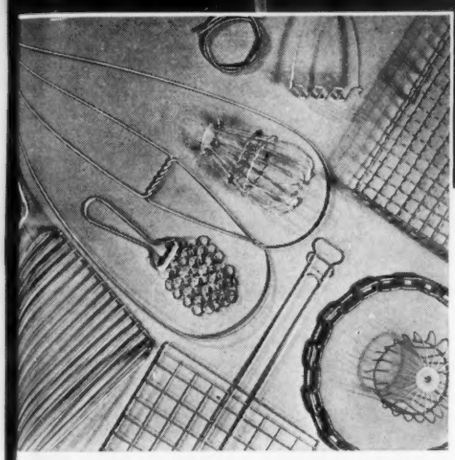
Snap!

BUT IT TAKES "KNOWING HOW"



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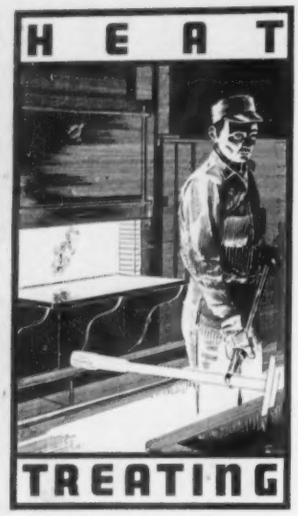


Flame-Hardening Methods

Increasing use of flame hardening involves a number of different methods of accomplishing best results. Shape, type of work and other factors are discussed and details of the most suitable procedure presented

By STEPHEN SMITH
Applied Engineering Department
Air Reduction Sales Co.
New York

■ PRINCIPAL advantage of the flame-hardening process is the possibility of obtaining full hardness on the surface of a casting or forging which already has been heat treated to give the maximum in physical properties for core strength. The process is equally well suited to hardening small contact areas on large surfaces which could be hardened only with difficulty by other methods.

By raising the surface of a part above critical temperature with the intense heat of an oxyacetylene flame, followed by quenching, a surface of the desired hardness is produced and the core remains tough.

Flexibility of flame hardening allows use of a number of methods to produce the surface hardness desired. In any case the equipment can readily be adjusted to take care of different sizes or shapes of surfaces.

Various methods of hardening may be listed as follows:

Flat surfaces may be hardened by the spot or unit area method where the torch is either stationary or in motion. Also, flat surfaces can be hardened by the progressive method.

Round surfaces may be processed by the progressive band, progressive spiral, spinning, or progressive spinning methods.

Spot hardening method processes a comparatively small or local area. Here the surface is first heated with a small flame or torch which may or may not be oscillated. This is followed by quenching.

In progressive hardening of flat surfaces, the torch is moved progressively along the surface at a constant speed heating the surface to a uniform temperature. The torch is followed closely by a quenching stream imparting uniform hardness due to uniform cooling action. When areas wider than the heating tip are to be hardened, several successive parallel passes may be made over the surface. In this case, an auxiliary water quenching stream should be applied at the end of the rows of flames. It should be directed on the already hardened area to prevent drawing the hardness from those zones. With care it is possible to prevent overlapping and skipping in making subsequent parallel passes and the narrow softer areas between passes can be made inconsequential in dimension.

Progressive hardening of round surfaces such as on large diameter cylinders and shafts is another method. This is done progressively in either parallel bands extending about the closed circumference or in a spiral band peripherally and for the full length. In the first case, the torch is fixed and the object is rotated at a surface speed of about

From a paper read before Tri-Chapter meeting of American Society for Metals, Cincinnati, and regional meeting of American Society for Metals at Rochester, N. Y.

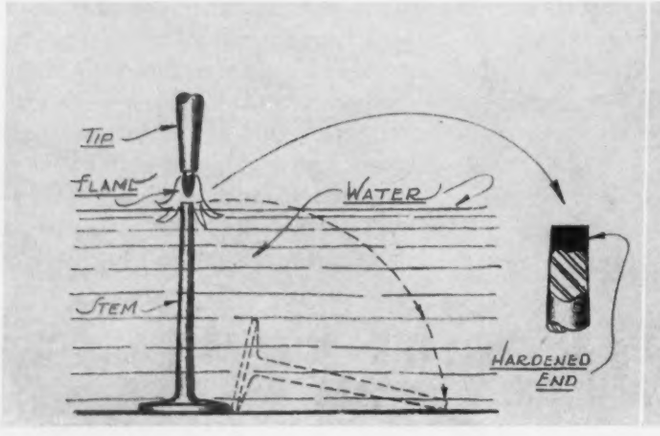


Fig. 1—Spot hardening a flat surface with the torch stationary

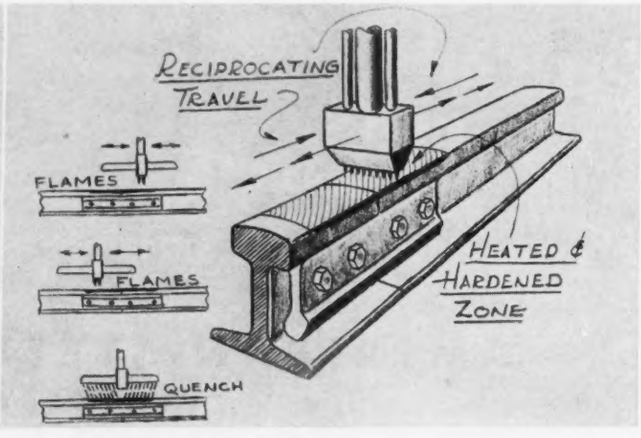


Fig. 2—Unit area method of hardening a flat surface with the torch in motion

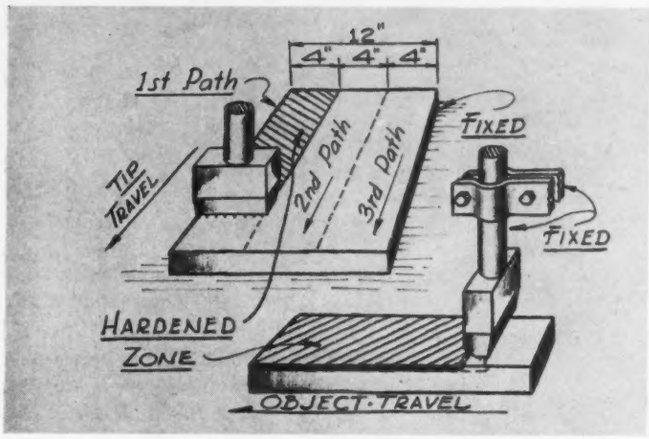


Fig. 3—Method employed in progressive hardening a flat surface

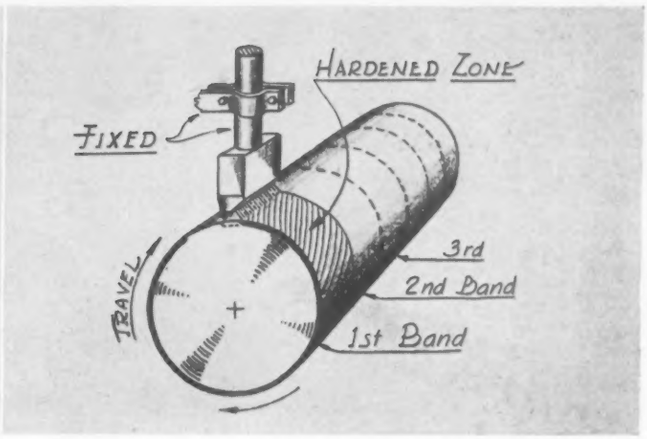


Fig. 4—Hardening a round surface by the circular band method

3 to 10 inches per minute past a multiflame tip until a complete revolution is made. As wide a heating tip as possible is used, followed immediately by a quenching stream. After each complete revolution, the torch is moved to the proper position for hardening the next successive band.

In the second case, the object is rotated at a surface speed, also about 3 to 10 inches per minute. The torch and quench are mounted in a suitable carriage which travels parallel to the axis of the part. Speed of carriage travel is synchronized with the speed at which the part is rotated so the carriage advances a distance equal to the width of the tip for each complete revolution of the object. In both cases an auxiliary quenching tip should be applied on the overlapping sides and at the ends of the rows of heating flames to prevent the flow of heat into adjoining hardened area, thus drawing the hardness.

Spinning method is applied to small diameter cylinders, shafts, journals and the like where narrow bands of complete circumference are to be hardened. Such articles may be processed by spinning the part at approximately 100 revolutions per minute under a heating tip equal in width to the surface to be hardened. When surface has been raised to the hardening temperature, the heating flames are withdrawn or extinguished, and a quenching stream is applied to the spinning surface.

If the part is small, often it can be released quickly from the holding device and dropped into a quenching bath. In hardening large diameter surfaces by this method, two or more tips may be spaced equally about the circumference to control the depth of hardness penetration.

Progressive Spinning

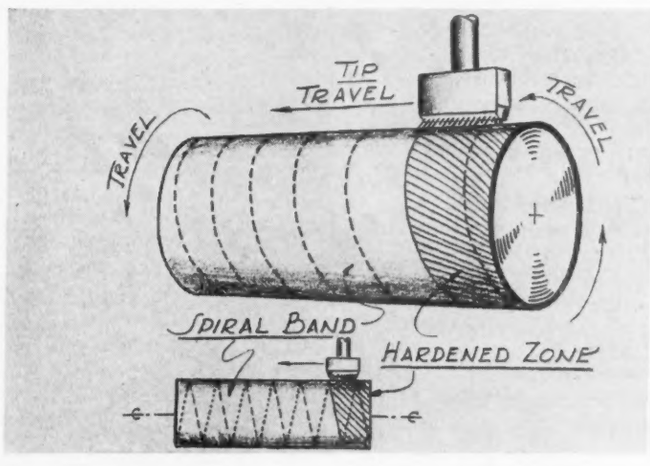
Progressive spinning method is applied to uniformly harden cylindrical surfaces of extended length. This method permits hardening such large surfaces without producing any zones of lower hardness. It is accomplished by spinning the object before a heating tip which travels at a constant speed along the surface or along the axis of the part being spun. The flames produce a circumferential heated band on the surface of the work. The band travels longitudinally at a speed of 4 to 10 inches per minute (speed of torch) and is followed by a circular quenching stream.

This produces a uniform hardened surface analogous to that produced in progressive hardening of narrow flat surfaces. Peripheral speed of rotation may range from 50 to 100 feet per minute. A number of tips may be spaced equally about the circumference of the object or a burner encircling and concentric with its circumference may be employed. It is followed immediately by a circular quenching jet.

Choice of most suitable material for flame hardening depends upon the service required. Where surface hardness is a primary factor, no advantage has been found in use of alloy steels. On the other hand, alloy steels are quite essential where higher core strength and greater shock resistance may be necessary.

Flame hardening may be applied to all SAE steels of 0.30 per cent carbon content or greater. The best range appears between 0.40 and 0.70 per cent carbon. In general all steels

Fig. 5—Here a round surface is hardening by progressing in a spiral band



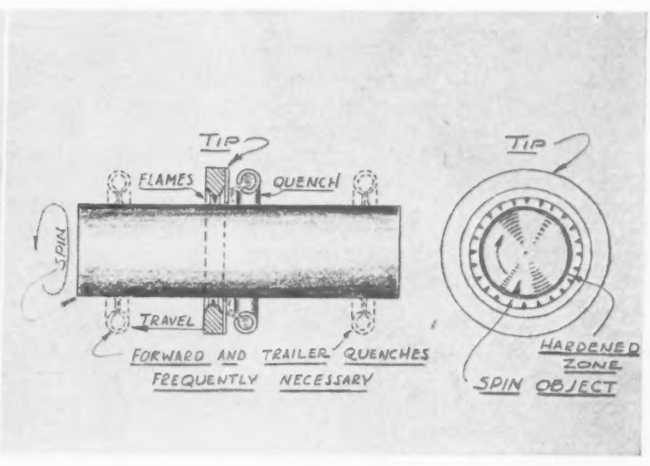


Fig. 6—Progressive spinning method is valuable for its speed

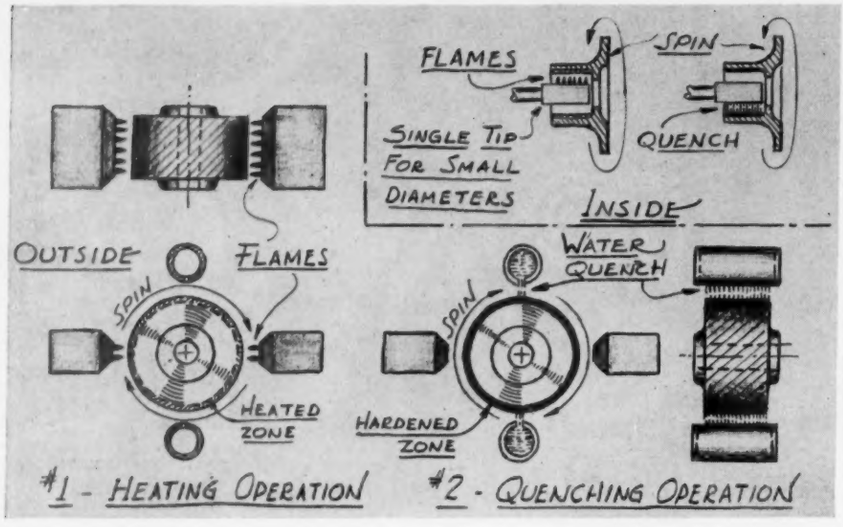


Fig. 7—Spinning method as shown here is adaptable to many objects

that can be hardened by normal furnace methods also can be flame hardened. Fine-grain steels appear best suited to the flame-hardening process. Care must be taken with coarse-grained steels not to overheat the metal as overheating further coarsens grain structure and causes surface checking.

Degree of hardness obtained depends upon carbon content of the steel. Hardness results in general follow closely results obtained in conventional furnace-heating and water-quenching methods. If existing variables are carefully regulated and co-ordinated, greater uniformity in degree and depth of hardness may be obtained in flame hardening work.

Distortion is minimized in flame-hardening process as heating and quenching are uniform and under definite control. Since it is more a local processing operation, less distortion results than where the whole mass is heated and quenched.

Normalizing and annealing to equalize stresses should precede flame hardening wherever possible —especially on cast iron and forged or cast steels.

Surface Temperature

Temperature of surface in flame hardening work is a function of size of tips, gas pressure, distance of flames from the surface, rate of torch travel, type of material being hardened and amount of quenching medium used. With gas pressure properly adjusted, temperature of the oxyacetylene flame remains constant.

Gas consumption required per square inch of surface heated depends of course upon depth of hardness and hardening time. In general it varies from 0.10 cubic feet of oxygen and 0.10 cubic feet of acetylene per square inch of surface hardened (depth 1/32-inch) to 0.50 cubic feet of each gas for a depth of ¼-inch.

Equipment available for flame hardening now includes a large variety of multiflame tips capable of maintaining stable flames under severe heating conditions and in close proximity to the heated surface. Water cooling and quenching connections and facilities are provided. The same torch can handle a small as well as large gas flow by merely changing the size of the torch mixer.

Extension tubes provide for thorough mixing of the gases. A quick shutoff valve permits stopping both gases at any desired point in the hardening operation without disturbing individual gas valve adjustments.

In progressive hardening of gear teeth, sizes 4 diametral pitch and larger, a tip is placed on each side of the tooth and both sides hardened simultaneously, thus eliminating the distortion that would occur if sides were hardened separately. For hardening gears of smaller pitches, a spinning method is employed using a water-cooled tip and no quenching jets. The heating flames cover the entire width of the gear face while the gear is rotated rapidly. When teeth have reached critical temperature, flames are extinguished and gear either dropped into a tank of quenching medium or a spray quench is directed upon it.

In progressive hardening, various types of machines such as a lathe carriage, drill press, boring mill, etc. may be adapted to propel the torch and tip over the area being hardened. Special machines are used for high-production hardening of such items as bevel gears, herringbone gears, camshafts, crankshafts, automobile hubs and rail ends.

Tests Calcium Chloride In Portland Cement

■ For proper curing of concrete, it must be prevented from drying out. Hence curing small applications of cement mortar or concrete properly may be difficult in hot, dry places such as boiler rooms, furnace rooms, drying rooms and other places where the temperature is maintained considerably above that of the outside air.

Calcium chloride has been used with considerable success as a surface treatment in such applications. Also, it has been used in small amounts as an integral admixture to concrete to lower the freezing point of the green concrete and hasten setting and hardening. However, in large amounts it lowers the strength of the concrete.

The question arises, "If the use of calcium chloride as an admixture is an aid in the solution of the curing problem, can the strength reduction due to large proportions of calcium chloride be offset by increasing the cement content?" as amount of construction often is so small that the proportion of cement used in the mix is of no importance economically.

Tests made at Ohio State university, Columbus, O., and published in the July, 1939, issue of "Ohio State University Studies, Engineering Series," vol. 8, No. 4, show that for construction in hot dry places, calcium chloride may be used in large proportions without reducing the strength and durability to such an extent as to be impractical.

However, the presence of calcium chloride in large proportions hastens the time of set to such a degree as to make placement difficult. Careful inspection must be maintained to insure that excessive water is not used to prolong this setting time, it is stated in the report.

Presence of calcium chloride reduces the time necessary for attaining working strength. According to the report, large proportions of calcium chloride should not be used in construction exposed to the weather or to alternate freezing and thawing, or stored in damp places.

Nickel Cleaner

■ To prepare nickel for chromium plating, a cleaner known as "Natrolin B-4 Chrome" has been developed by Sulphur Products Co., Greensburg, Pa. Cleaner is claimed to remove finger marks, buff-lap, buffing compositions, lime, etc., from nickel-buffed surfaces and to leave a bright surface for chromium plating.

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Bearing Spools

Production of large bearings for heavy-duty machine tools involves many problems. Details of forging procedure, unusual because of the mass of the pieces handled, are presented here. Bearing surfaces are flame hardened successfully

■ THE HEAVY-DUTY horizontal boring lathes now being completed by Niles Tool Works division, General Machinery Corp., Hamilton, O., for shipment abroad, have some interesting features. These units are not only unusual in general design, but also employ forged spools or sleeves for the main drive and revolving rest bearings, possibly the first time such a project had been attempted in this country. Bearing surfaces of the spools are flame hardened and finish ground. They revolve on bronze bearing rings.

The revolving rest spools, Fig. 2, are single forgings finished to 29¾ inches overall width, 51 inches inside diameter. A 7-inch wide flange, 72 inches outside diameter, was forged at each end of the spools, the bearing surface being 56 inches in diameter and 12⅝ inches in width. These forgings weighed 9320 pounds each before finish grinding.

These spools were forged by the Carnegie-Illinois Steel Corp. in its Homestead plant from SAE 1040 steel, cast in 68,770-pound ingots. The ingots were cast big end up in 48-inch fluted molds, the body of the ingot being approximately 114 inches long, with a 11,000-pound sink head provided to eliminate piping.

The main drive spools were made in two sections, see Figs. 1, 3 and 4, each section being forged from a single 62,118-pound ingot cast in 48-inch octagonal fluted molds. Sink heads were the same in both the revolving rest spools and main drive spools, but for the sleeves of main drive spools the body of the ingot was approximately 100 inches long. During final assembly, the two sections of these spools were bolted together, Fig. 4, and the drive gear keyed in position over a split spider clamped over the assembled sleeve.

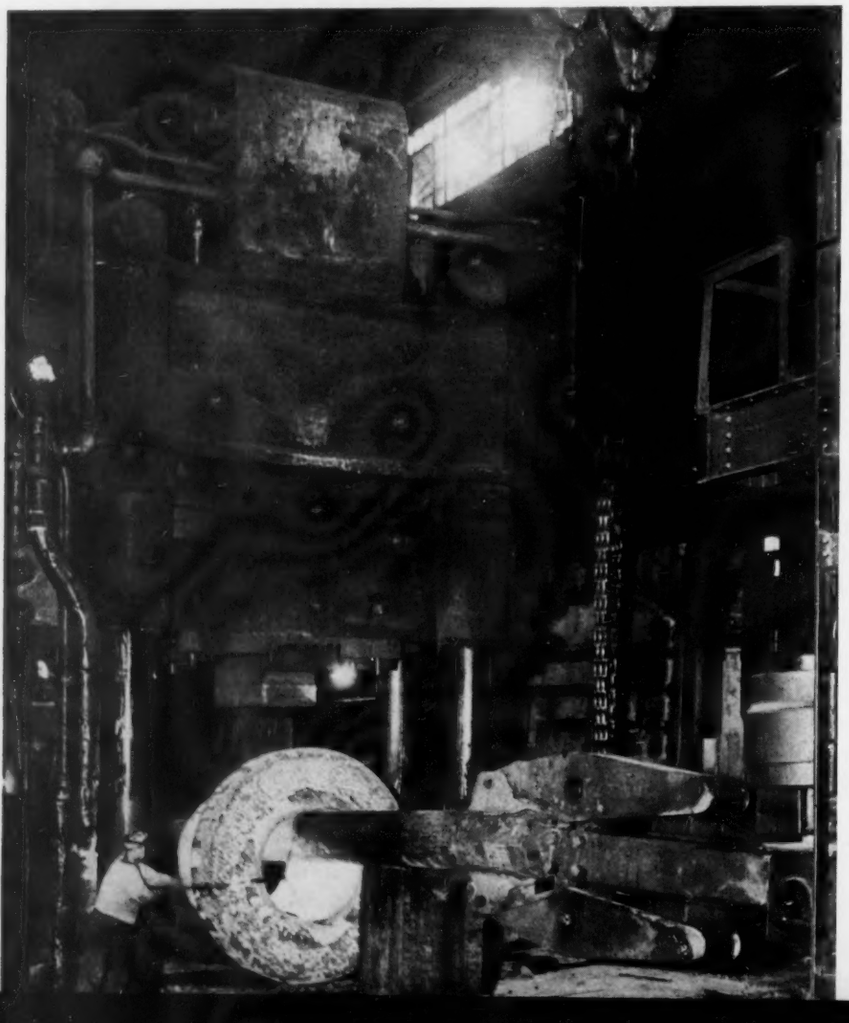

Fig. 1—Finish forging on a 3000-ton press using a 20-inch mandrel. Photos courtesy Carnegie-Illinois Steel Corp., Pittsburgh

Teemed from Single Ladle

Each ingot was teemed from a single ladle, three ingots being cast from an open hearth heat. As a control measure, the teeming temperature was recorded for each ingot, being approximately 2800 degrees Fahr. Particular care was exercised in controlling the analysis of the steel in these ingots to assure uniformity in hardening the finished product. All heats were within the prescribed limits.

Pouring and teeming temperatures were watched closely to assure clean ingots, free from ingot cracks and dirt. The steel was killed. Melting practice was such as to provide an inherent coarse grain structure, which was refined during the forging and heat-treating operations.

After stripping, the ingots were transferred by crane to gas fired preheating furnaces, 12 feet wide by 39 feet long and 11 feet high, two ingots being charged to a fur-

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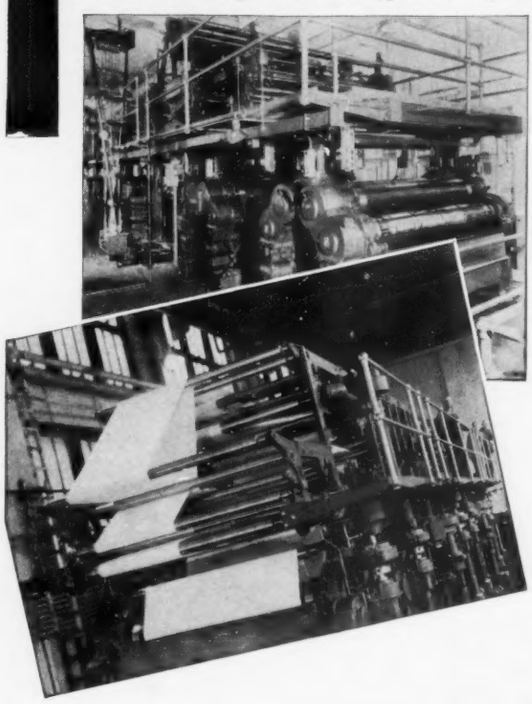

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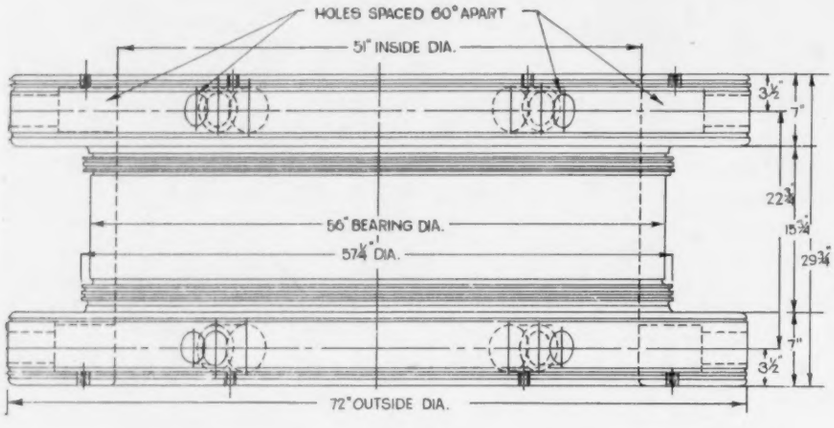
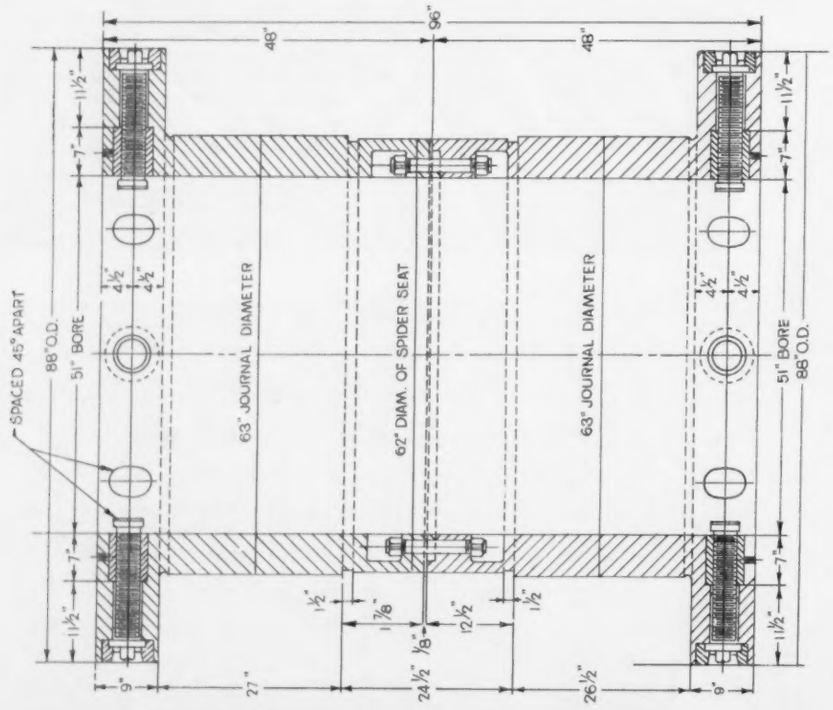
nace. In these furnaces they were raised to a temperature between 1200 and 1300 degrees Fahr. and equalized, the process requiring about 12 hours. They then were brought up to forging temperature, either in the same furnace or another more convenient to the press on which they were to be worked. This process took 15 to 20 hours.

At start of forging the revolving rest spools, Fig. 2, the large ingots were taken from the furnace by an overhead crane and delivered to a manipulator which handled the ingot by the sink head during the forging operation. The corrugations were forged out on a 3000-ton press and the ingot cut in half on the press and cropped to provide the two discs required, each of these ingots making two revolving rest spools. Each disc then was upset on the same press to square the ends. After this, the blocks were returned to a furnace for reheating.

When reheated, each block was taken by an overhead crane to a 12,000-ton press and mushroomed to the required diameter to provide the flange. When desired diameter had been secured, the block was lifted and reset on a piercing slab while a 21-inch diameter hole was pierced through it. Two piercing tools were used, the first being approximately 20 inches long and the second 40 inches long.

Following the piercing operation, the piece was again brought up to heat and forged to shape on the 3000-ton press, rotating the piece around a 20-inch-diameter mandrel and working it in such a manner as to expand the internal diameter of the spool without increasing the length of the piece. This completed rough forging of the revolving rest spools.





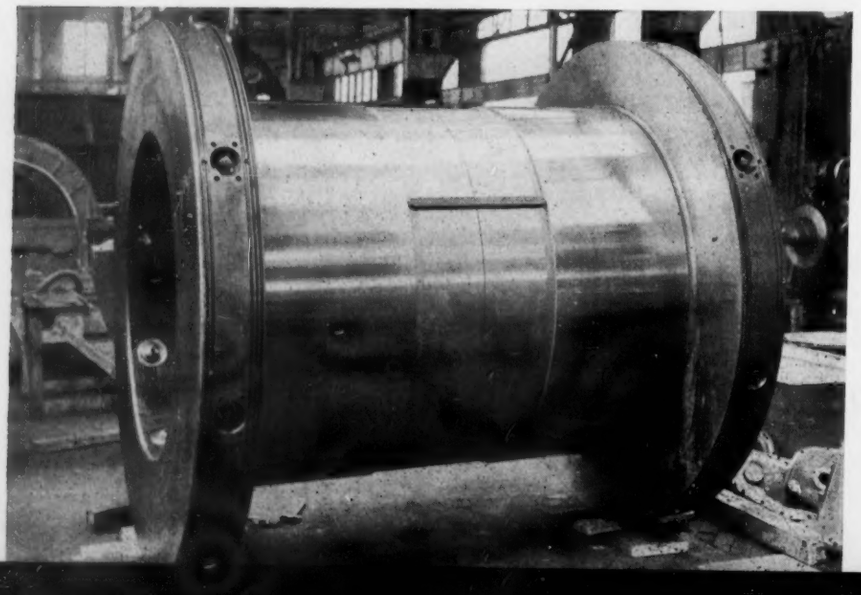


Fig. 2. (Top)—Diagram of revolving rest pool showing dimensions of these units. Fig. 3. (Center)—Cross section of main bearing spool with dimensions and showing method of joining the two sections. Fig. 4. (Bottom)—A main drive spool with its two sections bolted together ready to have drive gear keyed in position over a split spider which first is clamped over sleeve of the assembled spool shown here

Sleeves Made from Ingots

The large sleeves for the main drive spools were made from individual single ingots. These first were forged on a 3000-ton press to remove the fluting, then cropped and upset on the same press to square the ends. After reheating, they were transferred to the 12,000-ton press, placed in a 51½-inch-diameter die and the head mushroomed to the required diameter. When shaped, the piece was lifted and a countersunk washer placed under the flange. The piercing operation followed, leaving the sleeve with a 90-inch-diameter flange, 19 inches wide and 12 inches thick, and a barrel, 52½ inches long with a 21-inch hole running longitudinally through the piece. These were then the dimensions of the main drive spools after rough forging.

Finish forging of both types of spools was done on a 3000-ton press over a 20-inch mandrel, using a shaped hammer head to work down the body and to expand the sleeve without increasing its length. The finished forgings for each half of the main drive sleeves weighed approximately 37,500 pounds each, those for the revolving rest spools

weighing approximately 19,150 pounds each. Both had an internal diameter of 49 inches as they left the forge shop. Due to the size of these units, it was possible to work them on the presses over a period of approximately one hour before they had to be returned to the furnace for reheating.

Following the last finish-forging operation, the spools were allowed to cool on the floor to approximately 750 degrees Fahr. Then they were charged into a furnace and heated to approximately 1550 degrees Fahr. during a period of 18 hours, followed by soaking at this heat for 6 hours. After soaking, the spools were taken out of the furnace and allowed to cool in still air to approximately 750 degrees Fahr. again. Then they were returned to the furnace, which was at approximately 1200 degrees Fahr. and equalized at that temperature during a period of 14 hours. After being brought to heat, the charge was soaked for 10 hours at 1200 degrees Fahr., then taken out of the furnace and allowed to cool to room temperature in still air before machining.

The final forgings provided ample metal for rough machining. This work was done in a 120-inch vertical boring mill. The bore and outer flange faces were finish machined to dimension, while ⅛-inch of stock was allowed to remain on the bearing faces and inner flange faces to provide for finish machining, flame hardening and finish grinding. These operations were done by Westinghouse Electric & Mfg. Co. at East Pittsburgh, Pa.

Flame Hardening Satisfactory

Finished dimensions of the spools are shown in Fig. 2 and 3. Fig. 4 shows the assembled sleeve for a main drive bearing. Flame hardening produced a bearing surface of 400 to 450 brinell and proved to be a highly satisfactory and economical treatment. These spools are thought to be the largest units of the type ever flame hardened in this country and the operation involved the development of new practice and procedures.

Inspection of the forgings in the Homestead plant of Carnegie-Illinois Steel Corp. maintained a constant close supervision from the time the steel was melted in the open hearth furnaces on through to completion of the rough machining, followed by close co-operation with Westinghouse in finishing the job. Records show no trouble due to steel defects was encountered at any time on any of the forgings. Every piece was carried through to completion.

Although physical testing was not required, the steel being produced under extremely close control to the chemical specifications, tangential test pieces taken from the normalized and drawn forgings, one from each heat of steel, showed the following averages:

Yield point—40,250 pounds per square inch.

Tensile strength—78,500 pounds, per square inch.

Elongation—27.25 to 28 per cent in 2 inches.

Reduction in area—49 per cent.

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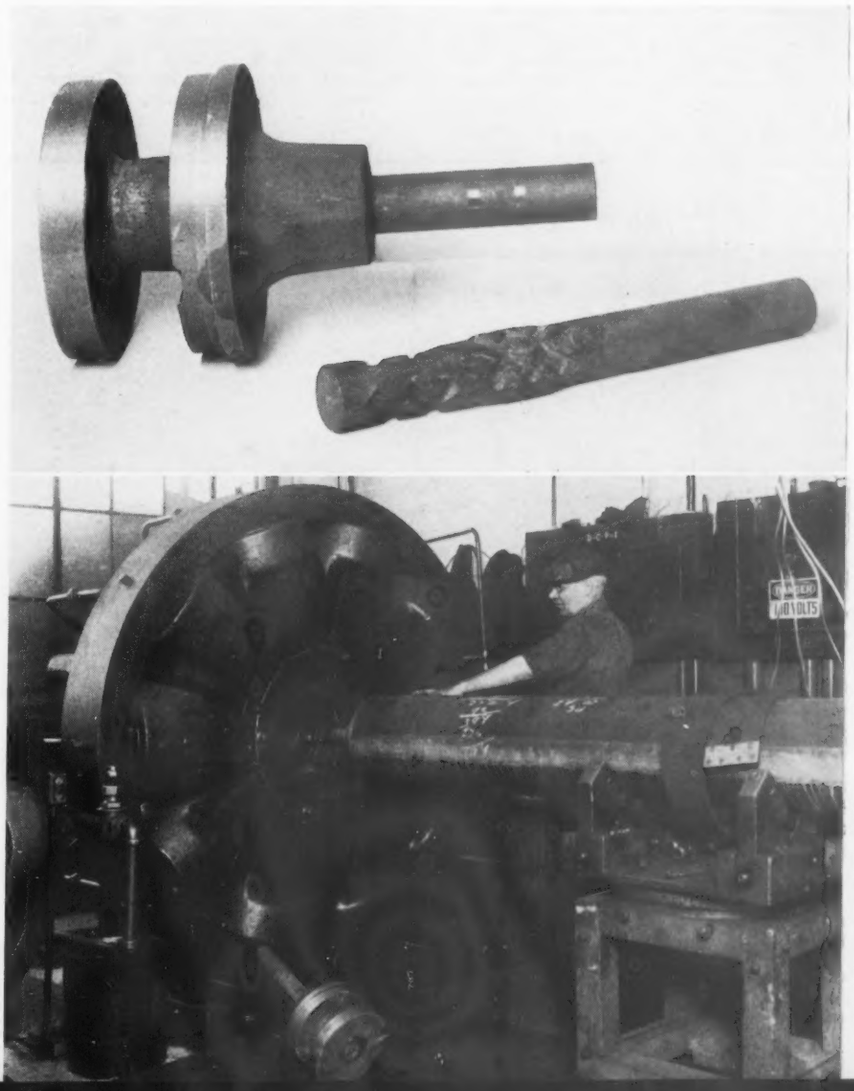
Tire-Setter Fixes Gudgeon in Pipe

■ AN INTERESTING fabrication method for the production of laundry flat-work iron rolls has been developed by American Laundry Machinery Co., Rochester, N. Y. These rolls consist of steel pipe with outside diameters ranging from 2½ to 12 inches and with lengths up to 120 inches. Design of the ironer requires the rolls to be fitted at both ends with a steel shaft so that motive power may be applied to them.

The method of fabricating and fitting these shafts involves forging of the shafts, casting Meehanite gudgeons onto the shaft and the tight and permanent fitting of the shaft and gudgeon into the pipe ends.

Bessemer steel shafts 2¼ inches in diameter and 2 feet long (used on the larger rolls) are cut from bar stock and centered. The shafts then are forged with a die under a drop hammer to make indentations into which the gudgeon metal may flow and take hold. The forged shafts are sent to the foundry, placed in dry sand molds and about 139 pounds of Meehanite metal poured on each to form a gudgeon. Gudgeons then are turned down to size to allow them to enter the steel pipe. The combined gudgeon and shaft then are placed into the ends of the pipe which, in turn, is compressed directly over the gudgeons by means of a West tire-setter to make a tight and permanent fit between gudgeon and pipe. Pipe deflection between gudgeon rims holds gudgeon in place. Both pipe and gudgeon shafts then are turned in a lathe for truing prior to assembly in the ironing machines.

Meehanite metal poured around a shaft with forged surface indentations to grip the metal make a gudgeon which is placed in the end of a laundry flat-work ironer roll to transmit motive power. A West tire-setting machine compresses the pipe around the gudgeon to form a tight permanent fit



A.S.M.E. Arranges Intense Program For Annual Meeting in Philadelphia

■ SESSIONS on iron and steel, machine shop practice, machine design, lubrication, instruments, railroads, work standardization, management, industrial marketing, and education and training, headline the sixtieth annual meeting of the American Society of Mechanical Engineers to be held at the Bellevue-Stratford hotel, Philadelphia. Dec. 4-8. This will be the first annual meeting outside of New York since 1890 and the first national one in Philadelphia since 1887.

In addition to 34 simultaneous sessions with 103 papers, the program includes the annual business meeting, social functions, inspection trips and a photographic exhibit. Sessions and papers of special interest to the iron, steel and metalworking industries are as follows:

Monday, Dec. 4

AFTERNOON

Business meeting.
Hearing on power test code for dust separating apparatus.

EVENING

Work Standardization

"Some New Techniques in Time and Motion Measurement," by Prof. D. B. Porter, New York university, New York.

Machine Shop Practice

"Machine Design and Motion Economy—Building Motion Economy Into Machine Tools," by O. W. Habel and G. G. Kearful, Saginaw Steering Gear division, General Motors Corp., Saginaw, Mich.

"New Method of Machine Tool Spindle Analysis," by Thomas Barish, Marlin-Rockwell Corp., Jamestown, N. Y.

Elasticity

"Distribution of Load on Threads of Screws," by J. N. Goodier, Cornell university, Ithaca, N. Y.

"Stresses and Deflections of Three-Dimensional Pipe Bends," by H. Poritzky and H. D. Snively, General Electric Co., Schenectady, N. Y.

Tuesday, Dec. 5

MORNING

Photoelasticity

"Stress Concentration Factors Around a Central Circular Hole in a Plate Loaded Through a Pin in the Hole," by M. M. Frocht, Carnegie Institute of Technology, Pittsburgh, and H. N. Hill, Aluminum Co. of America, Pittsburgh.

"Some Applications of Photoelasticity in Turbine-Generator Design," by M. Hetenyi, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"A Photoelastic Study of Stresses in Rotating Disks," by R. E. Newton, Washington university, St. Louis.

"A Theoretical Investigation of Plastic Torsion in an I-Beam," by D. C. Christophersen, Oxford university, England.

"A Two-Loaded Method of Determining Average True Stress-Strain Curve in Tension," by C. W. MacGregor, Massachusetts Institute of Technology, Cambridge, Mass.

Scientific Analysis of Managerial Problems

"The Engineering Method in Management," by A. I. Peterson, New York university, New York.

"Statistics Applied to Mass Production," by W. A. Shewhart, Bell Telephone Laboratories Inc., New York.

"Statistics in Formulation of Industrial Policy," by K. H. Condit, National Industrial Conference board, New York.

Machine Design

"Principles of Instrument Design," by C. S. Draper and George Bentley, Sperry Gyroscope Co., Brooklyn, N. Y.

"Quick-Acting Release Latches," by Carl Thumin, General Electric Co., Philadelphia.

Iron and Steel

"Production of Strip Metal of High Melting Points Directly from Molten Metal," by C. W. Hazelett, Hazelett Metals Inc., New York.

"Some Designs and Uses of Forged, Heat Treated and Hardened Steel Rolls in the Steel Indudstry," by J. R. Adams and H. L. Watson, Midvale Co., Philadelphia.

AFTERNOON

Dynamics

"Mathematical Machine Determination of Vibration of an Accelerated Unbalanced Rotor," by J. G. Baker, Baker Mfg. Co., Evansville, Wis.

"Measurement of Impact Strains by a Carbon Strip Extensometer," by R. Fanning, Massachusetts Institute of Technology, Cambridge, Mass., and W. V. Bassett, Bethlehem Shipbuilding Corp., Quincy, Mass.

"A Convenient Electrical Micrometer and Its Use in Mechanical Measurements," by Ross Gunn, United States naval research laboratory, Washington.

Industrial Marketing

"Marketing Movement in Mechanical Engineering," by J. R. Bangs Jr., Cornell university, Ithaca, N. Y.

"Gearing Engineering to Sales," by F. B. Heitkamp, American Type Founders Corp., Elizabeth, N. J.

"Use of Market Research in Introducing New Indudstrial Products," by Robert Gibson, General Electric Co., Schenectady, N. Y.

Wednesday, Dec. 6

MORNING

Education and Training

"Education and Training Apprentices for the Aeronautical Industry," by V. W. Page, consulting engineer, Middleboro, Mass.

"Apprentice Training," by R. E. Ellis, General Electric Co., Schenectady, N. Y.

"Apprenticeship in the Machine Tool Industry," by E. H. Neff, Brown & Sharpe Mfg. Co., New York.

Lubrication

"Influence of Crystal Size on Wear Properties of High Lead Bearing Metal," by J. R. Connelly, Lehigh university, Bethlehem, Pa.

"Temperature Distribution in Bearings," by E. S. Pearce, Railway Service & Supply Corp., Indianapolis.

AFTERNOON

Lubrication

"Boundary Film Investigations," by S. J. Needs, Kingsbury Machine Works, Philadelphia.

"Synthetic-Resin Bonded Bearings," by L. M. Tichvinsky, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Administrative Organization

"Administrative Organization in Government," by A. S. Fleming, United States civil service commissioner, Washington.

"Administrative Organization in Business and Industry," by L. A. Appley, Socony Vacuum Oil Co., New York.

EVENING

Annual dinner.

Thursday, Dec. 7

MORNING

Piping Symposium

"Significance of and Suggested Limits for the Stresses ir Pipe Lines Due to

Substation Features Metal-Clad Switchgear

■ **Metal-clad switchgear is emphasized at the Carondelet substation of the Union Electric Co. of Missouri. Nearly all apparatus, including the induction regulators is steel enclosed. View shows a 500-ampere, 4500-volt, 3-phase regulated feeder position. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.**

Combined Effect of Pressure and Expansion," introduced by D. B. Rossheim and A. R. C. Markl, M. W. Kellogg Co., New York.

Industrial Instruments and Regulators

"Thermostatic Bimetals," by S. G. Eskin, Robertshaw Thermostat Co., Pittsburgh, and J. R. Fritze, Edison G. E. Appliance Co. Inc., Chicago.

"Automatitc Control in Presence of Process Lags," by C. E. Mason and G. A. Philbrick, Foxboro Co., Foxboro, Mass.

Railroad

"Railway Car Engineering as Related to Development of Lightweight Cars for Railroad Passenger and Freight Service," by D. S. Ellis, Chesapeake & Ohio railroad, Cleveland.

"Progress in Railway Mechanical Engineering, 1938-39," by E. G. Young, University of Illinois, Urbana, Ill.

Mechanical Springs

"Calculation of Elastic Curve of a Helical Compressor Spring," by H. C. Keysor, American Steel Foundries, Chicago.

"Fatigue Tests of Helical Compression Springs at Wright Field," by C. T. Edgerton, Crucible Steel Co. of America, New York.

AFTERNOON

Materials Handling

"Canadian Mine Waste," by H. V. Haight and G. M. Dick, Canadian Ingersoll-Rand Co., Sherbrooke, Que.

"Theory and Operation of Continuous Weighing," by J. A. Flint, Jeffrey Mfg. Co., Columbus, O.

Set Hearing on Test Code For Dust Separators

■ With increase in the rate of combustion in modern stoker-fired steam-generating units and wide adoption of the pulverized-fuel method of firing, necessity for removing solid particles from the flue gas has increased. No standard or generally recognized method seemed available for determining adequacy of dust separating apparatus when installed in the power plant. Accordingly, the power test codes committee of the American Society of Mechanical Engineers some time ago appointed a new committee, known as individual committee No. 21, to draft a standard test code.

This committee has developed such a code which in its present form is believed to meet needs of all groups, manufacturers, public utilities, governmental agencies, etc. However, the committee has decided to supplement general distribution of tentative drafts of the code by a public hearing. This hearing will take place Dec. 4 at the Bellevue-Stratford hotel, Philadelphia, during the society's annual meeting. Copies of the proposed code may be obtained from society headquarters, 29 West Thirty-ninth street, New York.

The term "dust-separating apparatus" is intended to include all devices used for separating gas-borne solid particles from the medium in which they are carried. The code is designed to cover tests on all types of dust-separating apparatus installed for operation in conjunction with solid-fuel-fired furnaces. It may be applied to a much wider field, but is not applicable to devices used in cleaning air for ventilation.

Large Planer Cuts Machining Costs On Parts for Drop Forging Hammers

■ TO FACILITATE machining the larger parts of large-size steam hammers, Erie Foundry Co., Erie, Pa., has installed a large specially-designed planer of the double-housing type 16 feet 6 inches between housings and 14 feet 3 inches from table to underside of rail. Table length is 35 feet 10 inches and total weight of planer is nearly 900,000 pounds. The table alone weighs 100 tons and runs on three ways, a V in the middle and a flat at either side. The final table drive is through two racks, one on each side of the middle V.

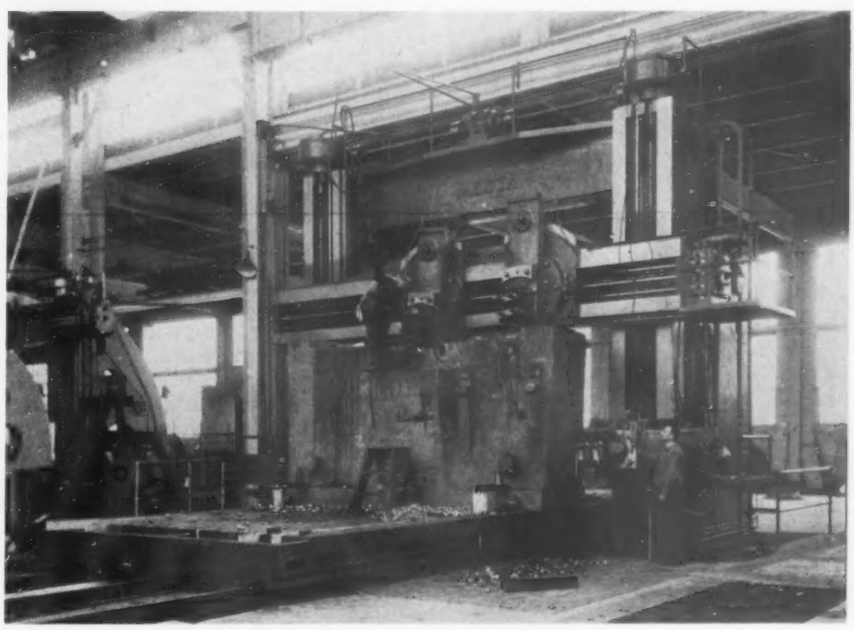
Drive and speed control are claimed to be the largest of the type ever built. The main motor drives the table through worm and spur gear reductions. Cooled by a separately driven blower, the motor is rated 75 horsepower although under some speed and torque conditions it will deliver twice this power. A speed range of 3.2 to 96 feet per minute is available in both cut and return directions. Each head has pneumatic tool lifters and an individual electric feed with a range of 1/64-inch to 1½ inches per stroke.

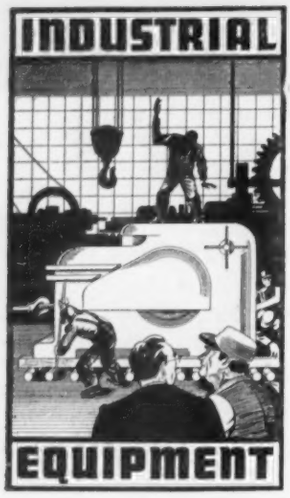
According to D. Angus Currie, president of the company, there has been a great increase in the size of parts made by the drop forging process and a corresponding increase in the requirements for very large drop hammers. The new planer will machine parts for the largest hammer anticipated for some time to come.

With the new planer, hammers are being built with anvils having a total weight of 500 tons and individual castings weighing 200 tons. The company now is building one 50,000 pounds rated steam drop hammer, three 35,000 pounds rated hammers and two 25,000 pounds rated hammers. Each of these machines has one or more parts which, because of the size or weight, could not be machined on any other planer.

Another important result of this planer installation will be its effective use for working out designs heretofore limited by the capacity of available machines in shops throughout the country. Designers in industries in other than the hammer industry have been interested in knowing that a machine of this large capacity is available and several instances have developed where pieces were cast integral with considerable saving in cost which, prior to the installation of this planer, had to be made in two or more pieces to become machineable.

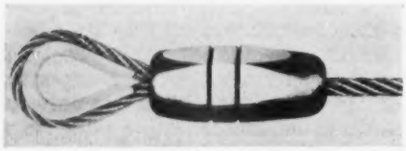
This large planer is machining top section of the anvil block for a forging hammer rated at 35,000 pounds. The piece weighs 130 tons





Wire Rope Clamp

■ National Production Co., 4561 St. Jean avenue, Detroit, announces "Safe-Line" wire-rope clamp which can be readjusted to proper tension without additional expense. The inner surface that grips the wire rope is double spiral splined to fit each strand and wire of the rope, thus making a secure grip on each section of each wire and strand. Gripping halves of the clamp are



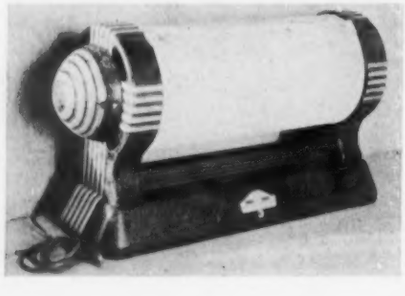
held tightly to the rope by taper threaded nuts.

There are no sharp wire ends nor projections. The clamp is high-tensile-strength steel. Stock sizes are for ropes ⅛ to ¾-inch.

Blue-Print Machine

■ Paramount Engineering Co., 5707 West Lake street, Chicago, offers "The Minute Man," a machine said to produce perfect blueprints or direct process prints in 1 minute or less. Print paper and tracing are wrapped around a crystal clear cylinder 8 inches in diameter by 19 inches long, and held tightly against the cylinder by a preshrunk canvas cover.

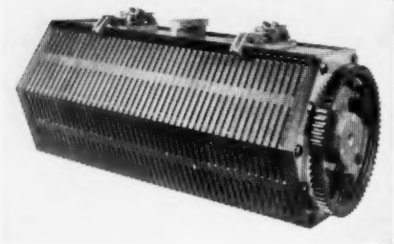
Light source is two No. 2 photoflood light bulbs mounted horizontally to give uniform light intensity.



Overall dimensions of machine are 9 x 26 x 14 inches high. It operates from any standard electric outlet, with no special wiring. Exterior surfaces are covered by baked-on wrinkle finish enamel, with ribs of polished aluminum.

Plating Cylinder

■ A new type of plating cylinder made of molded rubber sections rigidly held by steel support ribs on 4-inch centers is announced by Crown Rheostat & Supply Co., 1908 West Maypole avenue, Chicago. In place of ¼-inch panels, ¾-inch sec-

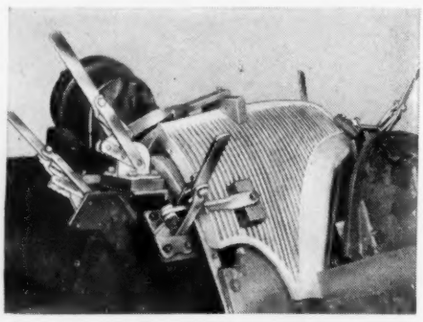


tions are used which give three times the amount of material for wear normally provided.

Standard slot openings are ¼, ⅛ and $\frac{1}{16}$-inch. These allow a much greater flow of solution through the cylinder than the former round perforations, and plating is greatly speeded up without an increase in size of cylinder. Slot openings can be adjusted down to $\frac{1}{16}$-inch.

Toggle Clamps

■ Kwik-Klamp toggle clamps of Danly Machine Specialties Inc., 2130 South Fifty-second avenue, Chicago, are claimed to clamp work quickly and positively in any position.



Any angle or compound angle can be obtained at point of clamping with clamps mounted directly on flat or vertical faces of die, jig or fixture. The steel clamping bar is adjustable from the horizontal upward to 50 degrees and downward to 90 degrees. All members revolve as a unit around the center pin in semicircular base and operating handle is adjusted to clear overhanging panels.

Clamps are suitable for clamping production parts in all types of fixtures for drilling, tapping, reaming, boring, welding, secondary press applications, and subassembly and final assembly operations.

Flourescent Fixture

■ A porcelain enamel, single-reflector, twin-lamp, fluorescent fixture is

announced by Benjamin Electric Mfg. Co., Des Plaines, Ill., to provide high efficiency and "daylight" color with reduced heat and glare. Known as the "Stream-Liter," this lamp has a wide-spread distribution of light comparable to dome-type incandescent lamp reflectors.

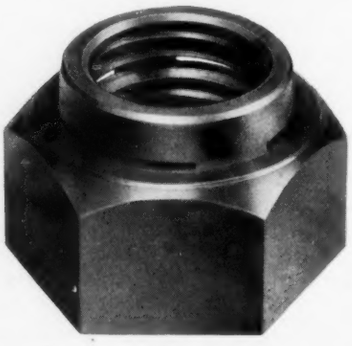
Deep shape of reflector provides adequate shielding, cutoff angle being 72½ degrees to the middle of the far lamp. Reflector has closed ends for additional shielding.

By spacing this fixture approximately on 10 x 10-foot centers and mounting it 10 feet from the floor, a uniform illumination over the working area of 20 footcandles or more is secured.

Lamps, sockets, thermal glow-switch type starters and line ballast equipment for regulating current to lamps are attached to the reflector. "Tulamp" type ballast units, which incorporate a capacitor in one lamp circuit to bring power factor to approximate unity, are used.

Self-Locking Nut

■ A self-locking nut for applications subjected to shock and vibration is offered by Lamson & Sessions Co., 1971 West Eighty-fifth street, Cleveland. The locking portion of the nut



consists of a raised crown section slotted perpendicular to the axis of the nut. This section is distorted so as to form an elliptical ring section resulting in an integral part of the nut having a smaller diameter at two diametrically opposite points

ADVERTISING PAGES REMOVED

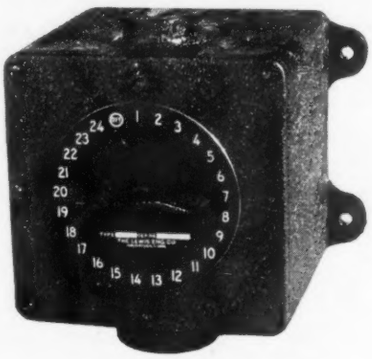
than the bolt or screw on which it is applied.

The nut is double heat-treated to give the crown a permanent set and tough resilient spring characteristic upon which the locking action depends. When applied, the nut spins on the bolt until the threads meet the locking crown. The nut is then wrenched on, forcing the crown to assume the circular cross section of the bolt. The gripping action of the crown on the bolt produces the friction necessary to prevent the nut from moving on the bolt. Nut will remain locked in any position on the bolt.

Thermocouple Switch

■ A moisture-proof thermocouple switch wall mounting, No. 80S, for use in taking readings from up to 24 thermocouple positions is announced by Lewis Engineering Co., Naugatuck, Conn.

The switch makes and breaks both conductors of the circuit. The con-

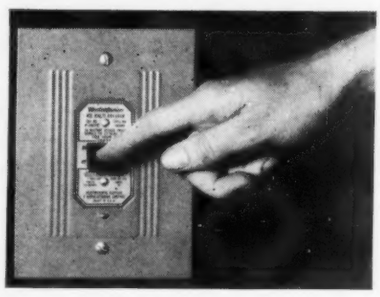


tacts, sliprings and brushes are unusually heavy. Brushes are phosphor bronze, and all contact is silver-to-silver to avoid corrosion.

Outside dimensions of the switch housing are 6 x 6 x 7 inches. All switches are supplied with an "off" position. Moisture-proof case is aluminum with dull black crystalline finish. Entire front plate of the switch is removable for attaching thermocouple lead wires and instrument lead wires. Complete unit weighs 5 pounds.

Small Multi-Breaker

■ A new 15, 20 or 25-ampere multibreaker is announced by Westing-



house Electric & Mfg. Co., East Pittsburgh, Pa. Surface type breaker is 6⅛ inches high, 4 inches wide, 2⅞ inches deep and is furnished for two and three-wire solid neutral 115 and 230-volt alternating current, one or two single poles, grounded or solid neutral.

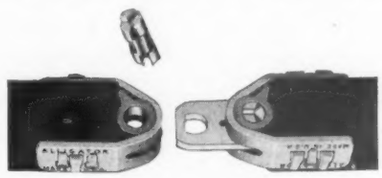
Indicating handle shows whether breaker is on, off, or tripped. Breaker cannot be held closed on a short circuit or overload. One motion of lever restores the current. There are no parts to replace. The unit is factory calibrated and sealed so that intended and proper capacity cannot be exceeded.

Supplied in either surface or flush mounting, the standard breakers have boxes enameled black, and covers of either black or gray. Aluminum finish also is available on both boxes and surface covers.

V-Belt Fastener

■ The Alligator V-belt fastener of Flexible Steel Lacing Co., 4607 Lexington street, Chicago, is now available for "B", "C" and "D" section V-belts of cross-woven fabric core to permit replacing matched lengths of V-belts on multiple drives without disassembly of parts.

The fastener consists of two die-formed steel end-plates, two bushings, two 2-piece rocker pins and special nails. The end plates are narrower than the belt so that no metal comes in contact with the sheaves and are held onto the ends of the belt by specially formed flat nails. The nails enter the belt with their flat sides parallel to the belt length, leaving the burden-bearing fibres in-



tact and without materially bulging the sides.

Each half of a fastener has its bushing and its rocker pin, and the two halves are joined by flat links. When assembling or disassembling a fastener, a simple rocker pin tool is used that engages in the T-shaped slits on end of rocker pin.

750-Ton Press

■ E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y., offers a 750-ton press of the four eccentric type. Slide is precision gibbed at all four corners with the sliding surface lined with bronze and is actuated by an eccentric drive to each corner. The eccentric shafts run front to back with the main bearings mounted in the heavy

crown ribs and distribute the thrust loads throughout the crown.

The press is double-geared with herringbone steel gearing throughout the main drive and twin driving gears on the crankshafts. All gears run in a bath of oil. Counterbalance cylinders mounted in the uprights and bed preserve the lines of the press.

The press operates at 14 strokes per minute and has a bed area of 80 x 120 inches. The die space, bed to slide, stroke down adjustment up, is 60 inches, with the stroke of the slide 24 inches.

Sensitive Drill

■ A sensitive floor-type drill for holes up to 5/16-inch in diameter and suitable for both high-speed production work and tool room requirements is announced by Crescent Mfg. Co., Rockford, Ill. The drill, known as the Redin No. 0, has a four-speed "rolling wedge" type of transmission which is claimed to be powerful as a gear drive and yet smoother running than a belt drive. Rolling contact in the drive practically eliminates wear and pressure

required in the drive is automatically adjusted to the work.

Spindle travel is 3⅜ inches and distance from the spindle to the column, 6½ inches. Table size is 10 x 12 inches and minimum distance between table and chuck is 2 inches and maximum distance, 20 inches. Motor is ½-horsepower with 1725 revolutions per minute and spindle speeds are 900, 1800, 3300 and 5000 revolutions per minute. Drill is equipped with grease-sealed ball bearings.

All-Metal Fluxers

■ Automatic Gasflux Co., 620 Frankfort avenue, Cleveland, has put on the market all-metal fluxers made of cast aluminum. Graduated flux regulating valve makes it possible to vary the amount of flux used by turning lever from one index to another to give a variable gas and flux mixture. Gasflux is placed in new fluxer through a filler cap in head and may be removed through a drain plug on side at level of bottom. Visual inspection of Gasflux

level is possible through a small glass window on front. Reserve tank to keep Gasflux at proper level can be mounted on top of fluxer by removing filler cap. To remove tank for filling at a distance from work, one union must be disconnected. Product is accepted by Underwriters Laboratory Inc. and Associated Factory Mutual Fire Insurance Cos.

Automatic Direct-Process Duplicator

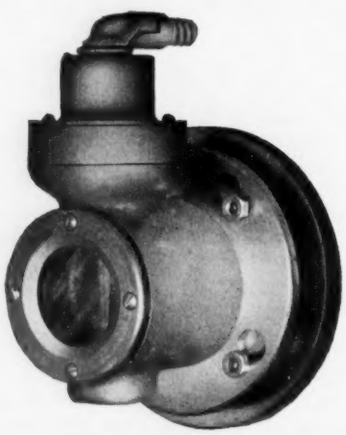
■ Ditto, Inc., Harrison at Oakley boulevard, Chicago, announces the new Hi-Speed Automatic, an electrically driven, self-feeding, self-ejecting direct-process duplicator that can produce 500 copies direct

from the original writing without aid of stencils or type.

The machine produces 70 bright copies per minute at a cost of about 4 cents per hundred. Copies can be made on paper of any size up to 9 x 17 inches. Sheets are ejected flat and face up. Tissue or card stock can be fed automatically, and four colors can be produced in a single operation.

Flame Detector

■ A flame detector to warn boiler operators of possible furnace explosion that may result from loss of ignition in boilers fired with fuels burned in suspension is offered by Bailey Meter Co., 1050 Ivanhoe road, Cleveland. This device consists of a light-sensitive phototube within a special air-cooled housing which is mounted on burner front or boiler wall, so that the phototube "sees" the flame at the point where ignition begins to take place. As long as the burner continues to maintain ignition, light from the flame reacts on phototube, causing it to have a low electrical resistance and thereby maintain a flow of current



through the amplifying tube in the photoelectric relay.

In case of flame failure, light to the phototube is immediately reduced, since its line of sight is trained at the point of ignition, where flame failures always start. Without direct light from the flame, phototube resistance increases sharply and flow of current in the amplifier is reduced, with the result that the relay operates to close or to open contacts for sounding an alarm.

In addition to showing complete loss of ignition, detector indicates "spotty" or "streaky" flame resulting from an intermittent or unsatisfactory fuel feed. This condition is shown by the fluttering of a small milliammeter located in the photoelectric relay casing, so that its indicating pointer may be seen by operators through a glass in the casing door.

Improved Punch

■ Whitney Metal Tool Co., Rockford, Ill., has improved its No. 5 Jr. punch by adding a depth gage and increasing the throat depth, which can be set from ¼ to 1¾ inches. By removing the gage, the throat depth is made 2 inches.

Weight of the punch is 2½ pounds, length over all is 8½ inches and height of gap is ¼-inch. Punch in center is 3½ inches. It has a

capacity of ¼-inch through 16 gage metal.

This punch comes complete with seven punches and dies in a "cannot lose-out" container and packed in either a paper carton or in a metal box. The punches and dies can be furnished in any size from $\frac{3}{16}$ to $\frac{9}{32}$-inch in $\frac{1}{64}$-inch steps.

Tests pH of Solutions

■ Kocour Co., 4724 South Christiana avenue, Chicago, offers a portable analytical set for measuring and controlling the pH (acidity or alkalinity) of nickel, acid zinc, copper, cyanide brass and other solutions by the colorimetric comparator method. The test can be made at the tank in a minute or so.

The comparator set consists of a hardwood box fitted with nickel plated brass hardware, nine color standards having easily read labels, a sealed tube of water, four graduated test tubes, a graduated dropping pipette, a bottle of indicator solution, a brush and complete instructions.

American Influence

(*Concluded from Page 51*)

auxiliary equipment is of American construction.

A third additional hot-rolled strip mill has been constructed and is in operation at a plant of the Otto Wolf concern at Neuenkirchen-Saar, whose plants for cold rolling both narrow and wide strip for tinplate are located at Andernach and Neuwied. Here also is seen the influence of American machinery and working processes.

Many of the old 2-high hand-type sheet mills have installed 3-high fully mechanized roughing-mills, pack furnaces and the like. This applies not only to Germany but also to Poland, Italy and France.

It is estimated that the sheet mills in continental Europe have built about 40 normalizing furnaces, and for second annealing are now following the American trend of the hood type furnace of various types of construction.

In tinning machines, where formerly the English type of construction was used, one can note a tendency toward the Aetna-Standard Engineering Co., Youngstown, O., type, which is now built in England by Head, Wrightson & Co., Ltd., for England and the continent. One Polish steel plant recently ordered several units of this modern tinning equipment.

In Great Britain, the International Construction Co., Ltd., is a firm with American connections which is installing equipment for a new sheet mill in India: a couple of fully-mechanized 3-high roughing-mills made in the United States are among this equipment.

The German company "Maschinenfabrik Sack," of Dusseldorf, has furnished several modern 4-high cold mills for rolling stainless steel and nonferrous metal in and near Sheffield.

♦

Oil-Well Bits Discussed

■ The paper, "Some Defects Found in Hard-Faced Drilling Tools—and Their Remedies," presented by C. W. Metzger, Haynes Stellite Co., at the Oil-World Exposition in Houston, Tex., April 26, 1939, has been issued in the form of a 20-page booklet. It describes a large number of cases and, by photomicrographs, illustrates most of the common bit defects. How to obtain the correct base metal structure, strong tungsten carbide insert-to-steel bonds and good tungsten carbide grain-to-steel bonds are explained. The effect of dissolved tungsten carbide on the base steel is discussed in detail. Copies can be obtained from Haynes Stellite Co., Kokomo, Ind.

for **PEABODY**

BLAST FURNACE GAS SCRUBBERS

The Peabody Scrubber and Moisture Eliminator, for cleaning and drying blast furnace gas, has received the one best endorsement that can be given to any process or equipment.

3 Peabody blast furnace gas cleaning installations for three different steel companies were placed in operation during 1939. All 3—or 100%—have since ordered a second Peabody Unit.

Peabody Gas Cleaning and Water Eliminating equipment can be installed in existing washers to deliver cleaner gas, free of moisture, —or—are available in complete units incorporating primary and secondary cleaning in a single shell. Costs of connecting piping and valves are saved.

★ *Investigate the newest, thoroughly proved equipment for cleaning blast furnace gas.*

PEABODY ENGINEERING CORPORATION
580 FIFTH AVENUE • NEW YORK
OFFICES IN PRINCIPAL CITIES

Economic Committee Hears Steel Leaders

(*Continued from Page* 21)

building and ship repair yards. He said the shipbuilding plants are the largest single units in the country.

Mr. Grace testified that his company has assets amounting to $715,800,000. He said that the ingot capacity of Bethlehem in 1938 was 13.7 per cent of the whole industry and that Bethlehem is the second largest producer. The corporation does business in every state.

Mr. Feller questioned Mr. Grace as to the manner in which price changes are made by his company. He called attention to the fact that the committee's primary concern is that of prices.

Mr. Grace explained the organization of Bethlehem and said a group of vice presidents and other officials have daily conferences. At these meetings the executives discuss all phases of the steel business, sales, production and prices. Instructions on prices are sent out by Bethlehem, the witness said, after the Steel corporation has announced its prices. Following this announcement, he testified, his organization goes over cost figures and announces its prices.

Mr. Grace was questioned regarding price increases in 1936 and 1937 and the decrease in 1938. He said that in 1937 he was glad the Steel corporation decided to increase its prices. Return on steel sold the latter part of 1935 and 1936, he stated, was not on a basis to allow any profit because the spread between the cost of manufacture and selling price was too small.

Wages Up 33 Per Cent

The witness stated that between 1929 and the present time wages in his company have increased from 32 to 33 per cent. Wage minimums now range from 56½ to 62½ cents per hour.

Average hourly wages in 1936 were 73.6 cents for his company against 73.7 cents for the Steel corporation; in 1937 the rate for his company was 87.7 cents and for U. S. Steel, 86.4 cents; in 1938 the average in Bethlehem was 89.5 cents and 90.2 cents for U. S. Steel.

Mr. Grace gave the committee the following tabulations of present wages for common labor: Sparrows Point, 56.5 cents; Cambria, 58.5 cents; Pittsburgh, 62.5 cents; Bethlehem, 56.5 cents; Buffalo, 59.5 cents; San Francisco, 60 cents; Los Angeles, 58 cents; and Seattle, 60 cents.

During late 1937 and early 1938, he said, it had been difficult for his company to get its base price. In fact, he said, it couldn't be done in most instances. All during that period, he testified, it was necessary to reduce the base price without making any formal announcement. It would not have been feasible to have made any announced base price reduction, he stated, because no one could tell when bottom had been reached. He said Bethlehem was glad to follow the Steel corporation's lead in reducing prices in 1938. He opined the old law of supply and demand is still operating.

There was some discussion regarding steel prices to the government when Mr. Grace testified his company had put in bids on the base price. He said during the "difficult" period there was no discrimination against the small buyer.

Dislikes War Business

During a discussion of the possibility of leveling off the sharp ups and downs of steel production, Mr. Grace declared he wished his company would never be called upon to build armaments, which he considered unsound business.

In response to questions, the Bethlehem president said the company had maintained a three dollar differential over Pittsburgh prices at Birmingham, Ala., before 1938. This was the same as charged by U. S. Steel which operates a subsidiary there. Bethlehem has no plant in the South.

Mr. Grace said he had never considered the base prices of the Steel corporation were too high, and cited the industry's earnings to support that view. Competitive conditions prevail in the industry, he declared. Otherwise there would be no breakdown of base prices.

The witness told the committee he never had met with other producers for purpose of setting prices, knowing such action would be in violation of the antitrust laws.

He opposed return to the codification principle of NRA, believing business better off without that kind of control.

Business must be run on a profitable basis, he said, adding that if costs rise to a point where profits vanish the industry must ask more for its products.

Prof. M. G. de Chazeau, associate professor at the University of Virginia, employed by the department of justice for these hearings as an economic consultant, told the committee reaffirmation of fourth quarter prices for the first quarter of the coming year would probably tend to reduce the pressure on the mills for speculative purchasing.

"There is some reason to believe," he said, "that this contribution toward its own stability and toward the stability of the economy as a whole might be made by the industry without serious loss of profits."

Professor de Chazeau testified that the present demand for steel "appears to be highly speculative with much of it going into inventories. As such it is unstable and likely to bring a future recession."

He further stated that although costs of firms dependent for raw materials on the spot market have undoubtedly increased, with few exceptions there is no evidence that costs for the bulk of steel production have been raised.

"Indeed, it seems probable that a more favorable operating rate has more than compensated for rising raw material costs. Third quarter profits available substantiate this conclusion but are not conclusive evidence because of potential depletion of stocks on hand, completion of existing favorable contracts, and resort to less efficient equipment during the fourth quarter."

The witness discussed studies which he had made of steel prices during the World war, later bringing the situation to date.

Discussing the present situation in the steel industry, Professor de Chazeau said that during the first seven months of 1939, steel production measured by the ratio of ingot production to capacity was reasonably stable at slightly more than 50 per cent. Actual fluctuations in the monthly operating rate varied from 47 per cent in May to 55 per cent in March. Beginning in August there was a marked improvement, the weekly rate rising to 63.5 per cent by the end of that month to make an average for the month of 62 per cent.

Traces Steel's Rise

With the declaration of war, the mills were deluged with orders and with specifications on existing contract business. Almost every consuming industry increased its demand. The principal exception was fabricated steel construction.

The witness said that "the weekly operating rate rose rapidly to 84 per cent at the end of September, 91 per cent during the final week in October.

"Prices of steel scrap, coke and other materials have risen as well as the price of pig iron but thus far, with the exception of reinforceing bars, published steel prices have not been advanced above the low levels reached last May. In some products, especially cold finished alloy steel bars, there have been upward revisions in extras while some of the nonintegrated producers have advanced prices on certain products (plates, nails, reinforcing bars). Apparently the trade expects some increases in the published prices of iron and steel for the first quarter of 1940."

Professor de Chazeau said that

(*Please turn to Page* 84)

Cash Register

(*Concluded from Page* 58)

floor level at which he wishes the box to be discharged. Then he pushes the box on a short section of roller conveyor at the table level. From then on operations are entirely automatic. The elevators travel continuously, and as soon as an open lift section arrives at the pick-up point, the stock box discharges automatically on the pickup arms in the elevator mechanism. Also, the pickup mechanism has been set to adjust a trip mechanism on the elevator which then acts to discharge the box at the desired floor level after box has reached the top of elevator and is traveling down on the delivery side.

Discharge at desired floor level also is automatic. As the box passes the desired discharge point, it is tripped off on a section of roller conveyor which may deliver it on a supplementary conveyor to some other point on the floor where its delivery may be desired.

In addition to the 8½ miles of belt conveyor and elevator system just described, there are many other chain conveyors such as the one shown in the back ground of Fig. 1. This is part of the finishing department where cash register cabinets are being polished. Buffing wheels may be seen in a row along the windows.

A number of other chain conveyors are employed throughout the plant. Probably more of them are located in the finishing department than elsewhere as here they are utilized in spraying, electroplating, cleaning and similar operations.

The above description has endeavored to show how a tremendous handling problem has been solved remarkably well by an excellently co-ordinated system of elevators, belt conveyors and other types of handling equipment to move a tremendous volume of small parts.

•

Water-Proof Resurfacer For Cement Tile Roofs

■ A method of treating weather-exposed porous surfaces, such as roofs, made of concrete, brick, stucco, tile, etc., known as the "Por-Lox System" has been developed by Truscon Laboratories, 1720 Caniff avenue, Detroit. The resulting coating consists of essentially two materials: Por-Lox waterproofing, which keeps out water and prevents saponification of the lime found in most concrete and stucco surfaces; and Pro-Lox colored, which is applied over the waterproofing coating and restores coloring to the surface.

ON EVERY CARLOAD HANDLED

That's *real* economy—the kind of economy that YALE Electric Trucks make possible for the Ball Brothers Company of Muncie, Indiana.

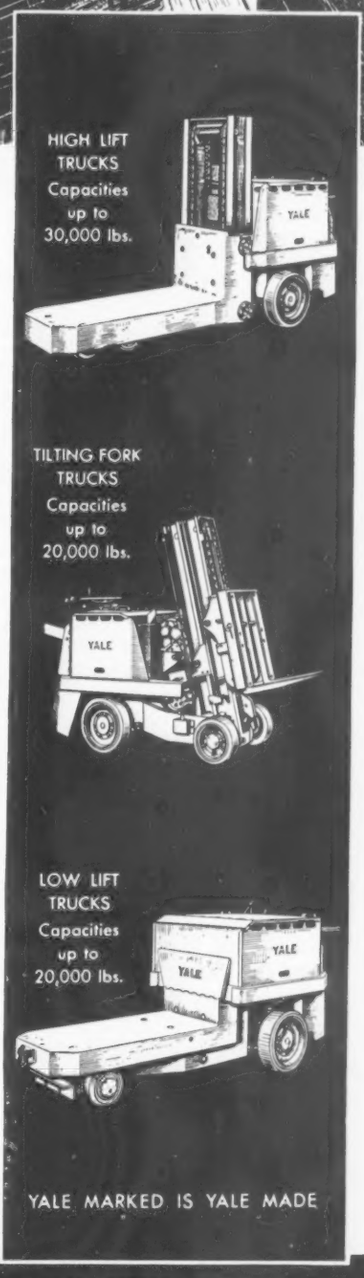
Before installing their YALE Electric Tilting Fork Truck, it took 8 men 4 hours to unload one carload of zinc. Today, the same job is done by one man in two and one-half hours! In addition, the possibility of accidental injury to workmen has been practically eliminated and the busy railroad switch is kept constantly clear for other traffic.

Say Ball Brothers:

"The first of our nine YALE Electric Trucks, purchased more than 12 years ago, still are in daily use and giving highly satisfactory service. YALE standardization of parts permits keeping our older trucks thoroughly modern and up-to-date. We consider the maintenance requirement very low. We feel that the demonstrated dependability and long life of our YALE trucks *justifies the confidence we have placed in your equipment.*"

YALE *always* justifies the industrial confidence placed in their equipment—because YALE Electric Trucks always deliver the goods! Just as modern YALE methods helped Ball Brothers solve a particular handling problem—they can help YOU.

A staff of competent engineers stand ready with the cost-cutting answer to your handling worries. Call them in—through your nearest YALE representative, or send direct for free catalogue.


HIGH LIFT TRUCKS Capacities up to 30,000 lbs.
TILTING FORK TRUCKS Capacities up to 20,000 lbs.
LOW LIFT TRUCKS Capacities up to 20,000 lbs.
YALE MARKED IS YALE MADE

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THE YALE & TOWNE MFG. CO.
PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
IN CANADA: ST. CATHARINES, ONT.

Economic Committee Hears Steel Leaders

(*Concluded from Page* 82)

the natural increase in requirements of iron and steel has been exaggerated by speculation, "the origin of which is anticipation of war purchases and the permanence of which is determined by the course of the war.

"Although statistical data are not available, investigations by the department of commerce indicate that much of present deliveries is going to swell inventories. A possible exception is the automobile industry for which seasonal demand for steel happened to coincide with the speculative war purchases of steel.

"Speculative purchases have been made in part to provide capacity to supply expected needs of belligerents and neutrals. But, in part, the existing sellers' market is created by the expectation that iron and steel prices will rise and that actual shortages will develop."

Sees Short-Lived Boom

Discussing the present demand Professor de Chazeau said that to the extent that present demand is going into speculative inventories against a probable rise in prices or even a shortage of steel occasioned by war business, "there is reason to believe that it will prove short-lived and that existing pressure on mill capacity will be relieved. A stable back-log of business from the railroads, the government defense and merchant shipbuilding program, the automobile industry and possibly the farm implement and canning industries, suggest, however, that a major set-back is not necessarily imminent."

Ernest T. Weir, chairman, National Steel Corp., Pittsburgh, and president, American Iron and Steel institute, testified Friday. He explained his price policy as outlined in an address before the American Institute of Steel Construction Oct. 17.

Mr. Weir declared each steel company should sell its product on a basis of its cost plus reasonable profit—from its own standpoint—and should insist on this at all times. Management is not justified in letting prices get down to a point where it sustains a loss. Losses, of course, are inevitable in periods like 1932 when steel production fell to 19½ per cent of capacity.

The steel industry's price policy from 1930 to 1939 has been a failure he declared. While the industry was investing $2,100,000,000 to maintain and improve its plants and equipment and to improve its products, it was losing a total of $90,000,000.

Mr. Feller expressed much interest in Mr. Weir's price policy plan, said the committee wants to find out how the industry can make a reasonable profit at all times.

Mr. Weir replied he can see only three ways to convert the industry's loss into a profit. These are: "Increased income could be realized from increased volume; from reduced costs resulting from reduced capacity; or from increased return on existing volume.

At 35 per cent operation, Mr. Weir said, the industry should not lose money. He said he was in favor of fluctuating prices. When costs are down, prices should be reduced, and this has been done in the past. When demand is good, the industry should make a good profit to compensate for small profits during lean years.

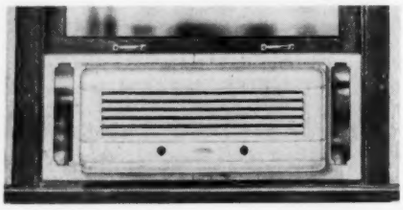
Mr. Weir gave the committee factual details about his own company, said it is fifth in size, has $225,000,000 assets, is an integrated company and gave location of plants and products manufactured.

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., took the witness stand late Friday afternoon. At the request of committee members he went into detail regarding the continuous strip and sheet rolling mill development of his company. He discussed the rolling of sheets up to the time of the continuous mill development to the present.

Friday the committee announced it expects to call officials of Wheeling Steel Corp., Wheeling, W. Va., South Chester Tube Co., Chester, Pa., and National Tube Co., Pittsburgh on Nov. 13.

NEW METAL PRODUCTS

■ Positive circulation of room air ranging from a gentle breeze to a 20-mile-an-hour wind can now be obtained with the new weatherproof 1940 model Silentaire electrically operated window ventilator announced by Berger Mfg. division, Republic Steel Corp., Canton, O. Agita-



tion of room air is effective up to a distance of 50 feet. A thermostat provides for speed control of the discharge, and adjustable louvers permit direction of air current as desired to prevent drafts. Controllable mixing damper permits blending of outside and room air in correct proportions for each season of the year and filter employed is 97½ per cent efficient in removing pollen and bacteria. Capacity of ventilator is 650 cubic feet per minute anemometer volume.

■ Streamliner steel desks manufactured by Globe-Wernicke Co., 2600 Carthage avenue, Cincinnati, have a concealed leveling device making it possible to adjust pedestals for uneven floors. The flat top desks are furnished with full closed-in back and automatic device controlled by wide center drawer to lock all drawers. Rounded edges of front and sides of top, which is finished in

dark green battleship linoleum, harmonize with modernistic design. Drawers are interchangeable.

■ Bendix-Westinghouse Automotive Air Brake Co., 5001 Center avenue, Pittsburgh, announces its new air-operated "zephAIRtone" horn for use on commercial motor vehicles. Featuring a dual tone with an unmistakable note of authority, the signal is pleasing in quality and is claimed to be entirely unaffected by head wind or rush of air, such as may be encountered at higher speeds. By test it has been found that warning signal confines itself very closely to the immedite highway. A foot control has been added to an entirely new and improved hand control. This horn is available in kits designed either for field or factory installation.

J & L Prepares Piping System Color Charts

■ Colors used in standard classification of piping systems to identify fire protective units and piping carrying dangerous or valuable materials have been charted by Jones & Laughlin Steel Corp., Pittsburgh.

Chart is prepared for distribution to foremen, maintenance and safety engineers, others responsible for protection of property and workmen in industrial plants and buildings. It is based on "Recommended American Practice Scheme for the Identification of Piping System," approved by American Standards association. Copies may be obtained free through local J. & L. standard pipe distributors and jobbers.

Steel Buying Off; Deliveries Heavy

Consumers' Early Needs Show No Slackening; Scrap Declines

MARKET IN TABLOID ★

Demand
Active for current shipments; forward orders lighter.

Prices
Steady; tool steel extended through 1940.

Production
Unchanged at 93 per cent.

■ STEEL buyers show no letdown in immediate needs but are less active in making forward commitments. A steadier situation also prevails in mill operations, steel ingot production last week being unchanged at 93 per cent.

Rapidity with which mills stepped up shipments the past 60 days has done much to allay fears of serious delays in deliveries next quarter. With early requirements satisfied, some buyers are awaiting price announcements for next period before contracting extensively.

Mills already have fairly large backlogs for early-1940 delivery, particularly in flat-rolled steel, and indications point to no marked letdown in production with the turn of the year. However, in the event prices are reaffirmed for next quarter, part of the incentive for buyers to take complete shipment before Jan. 1 against old orders will be removed.

Previous expectations of higher prices next year have been modified considerably the past few weeks. Various circumstances contribute to this changed thinking, including the European situation, lower scrap prices and the TNEC hearing. At the same time, price advances on tin plate and galvanized products would not be surprising, in view of the higher cost of zinc and tin.

A leading producer has announced extension of the present price on tungsten tool steel through 1940.

While the price factor is attracting less attention of buyers and orders are lighter, mills continue pressed for sustained or expedited shipments against previous bookings. In some instances this necessitates revised schedules to accommodate consumers who had underestimated their requirements.

Railroads are less active in equipment and track material buying. Heavy purchases since Sept. 1 have removed the bulk of pending business of this type from the market, although car builders and railroad shops are busy in filling old orders and are faced with several months of active schedules. Part of recent large rail bookings will not be rolled until next quarter, due to more urgent need elsewhere at this time for raw steel supplies.

Restricted operations of the automotive industry have been without noticeable effect on finished steel production. Consumption will move sharply higher when current labor difficulties are removed. With Chrysler plants still closed last week, assemblies of 86,200 units barely exceeded the total a year ago. However, this was a gain of 3500 over the week before. Active retail sales of automobiles would permit assemblies to approach the record fall rate attained in 1936 were it not for the labor situation.

Shipbuilding continues to account for large lots of heavy steel products. Contracts for additional boats are few, but vessels under construction Nov. 1 totaled 245 with a gross tonnage of 1,184,360. This compares with 126 vessels of 459,775 gross tons a year ago.

Farm equipment builders are more active steel users and are expected to reach a peak in production early in December. Shall tractors comprise an important part of current output.

Export markets for steel and pig iron are fairly active. Orders being placed are smaller than the tonnage expected to be taken next quarter, since inability of mills to give desired delivery is a factor in restricting foreign business.

Inquiries for structural shapes and concrete reinforcing bars are declining, the drop being partly seasonal but also reflecting heavy contracting the past 60 days.

Scrap prices have eased further in a relatively quiet market. The price composite declined 50 cents last week to $20.33. This brings quotations back to the late-September level and compares with the recent peak of $22.16.

Pig iron production holds near a record rate, with several more furnaces scheduled to go in blast this month. Foundry requirements of pig iron and coke are sustained.

Five districts curtailed steelmaking last week, as open-hearths were withdrawn for repairs. Offsetting these losses were gains of 1 point to 94 at Pittsburgh, 4 points to 84 in eastern Pennsylvania and 1 point to 93 at Youngstown. Reductions were 10 points to 90 in New England, 3 points to 90 at Buffalo, 2½ points to 87½ at Cleveland, 3 points to 87 at Cincinnati and 3 points to 77 at St. Louis. Unchanged were Chicago at 91, Wheeling at 93, Birmingham at 94 and Detroit at 100.

COMPOSITE MARKET AVERAGES

	Nov. 11	Nov. 4	Oct. 28	One Month Ago Oct., 1939	Three Months Ago Aug., 1939	One Year Ago Nov., 1938	Five Years Ago Nov., 1934
Iron and Steel	$37.53	$37.62	$37.56	$37.62	$35.95	$36.39	$32.15
Finished Steel	55.90	55.90	55.90	55.90	55.60	56.68	54.00
Steelworks Scrap..	20.33	20.83	20.83	21.45	15.30	14.58	9.82

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Nov. 11, 1939	Oct. 1939	Aug. 1939	Nov. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.15	2.13	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15-2.40	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.10
Wire nails, Pittsburgh	2.55	2.50	2.40	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to 9/32-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Nov. 11, 1939	Oct. 1939	Aug. 1939	Nov. 1938
Bessemer, del. Pittsburgh	$24.34	$24.34	$22.34	$22.34
Basic, Valley	22.50	22.50	20.50	20.50
Basic, eastern, del. Philadelphia	24.34	24.34	22.34	22.34
No. 2 foundry, Pittsburgh	24.21	24.21	22.21	22.21
No. 2 foundry, Chicago	23.00	23.00	21.00	21.00
Southern No. 2, Birmingham	19.38	19.38	17.38	17.38
Southern No. 2, del. Cincinnati	22.89	22.89	20.89	20.89
No. 2X, del. Phila. (differ. av.)	25.215	25.215	23.215	23.215
Malleable, Valley	23.00	23.00	21.00	21.00
Malleable, Chicago	23.00	23.00	21.00	21.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	28.34	28.34
Gary forge, del. Pittsburgh	23.17	23.17	21.17	21.17
Ferromanganese, del. Pittsburgh	105.33	105.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$22.25	$23.15	$16.15	$15.15
Heavy melt. steel, No. 2, E. Pa.	19.25	20.00	14.40	12.75
Heavy melting steel, Chicago	18.25	19.25	13.75	14.20
Rails for rolling, Chicago	20.25	21.90	17.75	17.40
Railroad steel specialties, Chicago	21.50	21.75	15.50	16.10

Coke

Connellsville, furnace, ovens	$5.00	$4.75	$3.75	$3.75
Connellsville, foundry, ovens	6.00	5.80	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c-2.54c
Philadelphia, del.	2.15c-2.40c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.35c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c-2.35c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(*Base, 20 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(*Base, 5 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Detroit, delivered	2.25c
Cleveland	2.15c

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast points	2.75c

Iron

Chicago, Terre Haute	2.15c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	2.15c
Gulf ports	2.50c
Pacific Coast ports	2.60c

**Base prices 20 cents less per 100 lbs. in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails	$2.55
(Per pound)	
Polished fence staples	2.55c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.88; two-point cattle, 80-rod spool	$2.70
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	67.00
Single loop bale tie, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh $3.70

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Pacific Coast points	2.60c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.35c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, for full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller	70.0 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.85c
Pacific coast ports	2.90c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers	60 off
and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	.....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$5.00- 5.50
Connellsville, fdry.	5.75 -6.25
Connell. prem. fdry.	6.00- 6.50
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 6.50
Wise county fur.	5.00- 5.25

By-Product Foundry

Newark, N. J., del.	11.38-11.85
Chicago, outside del.	10.50
Chicago, delivered	11.25
Terre Haute, del.	10.75
Milwaukee, ovens	11.25
New England, del.	12.50
St. Louis, del.	11.75
Birmingham, ovens	8.25
Indianapolis, del.	10.75
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	11.25
Detroit, del.	11.00
Philadelphia, del.	11.15

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.)	14.75c
Do. (1000 lbs. or over)	13.75c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	.....	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	.....	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	24.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
St. Louis from Birmingham	†23.12	....	22.62	....
St. Paul from Duluth	25.63	25.63	....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $27.50; 6.51-7—$28.00; 7-7.50—$28.50; 7.51-8—$29.00; 8-8.50—$29.50; 8.51-9—$30.00; 9-9.50—$30.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00
Ohio	
First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$26.00-$27.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	22.00
Do, barge	22.00
No. 2 lump	22.00

Ferroalloy Prices

Ferromanganese, 78-82%, tide., duty pd. ...$100-110.00
Do., del. Pitts., ..105.33-115.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot.. 32.00
Do., 26-28% 39.50

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent..... 126.00
Spot, $5 a ton higher.

Silicomanganese, 2½ c. 103.00 2% carbon, 108.00; 1%, 118.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 2.00-2.10

Ferrovanadium, 35 to 40%, lb., cont...2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c
67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots..... 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb...	16.50c	17.25c	17.75c
1% carb...	17.50c	18.25c	18.75c
0.10% carb.	19.50c	20.25c	20.75c
0.20% carb.	18.50c	19.25c	19.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots... $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb.... 1.35
Do, less-ton lots..... 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls... $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill.... 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton..$142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots.... 150.00
15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots. 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. .. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots..... 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.50
Do., smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract... 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots.. 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.86	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.23	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.85	4.35	3.55	3.55	5.25	3.55	4.55	4.93	3.51	4.06	8.56	7.16
Baltimore	3.95	4.05	4.45	3.70	3.70	5.25	3.55	....	5.05	....	4.05	....	....
Norfolk, Va.	4.15	4.25	....	3.90	3.90	5.45	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	6.40	4.20	4.40	4.50	4.45	6.15	10.40	9.55
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.75	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.72	3.20	3.75	8.15	6.75
Detroit	3.58	3.68	3.68	3.75	3.80	5.42	3.43	4.50	4.84	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.85	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	5.00	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.73	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.68	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	....	5.19	....	4.69	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
*Seattle	4.00	3.85	5.20	3.40	3.50	5.75	3.70	6.50	4.75	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	4.75	....	5.75	....	....
Los Angeles	4.15	4.65	6.35	4.00	4.00	6.40	3.75	6.40	5.15	....	6.15	10.65	9.80
San Francisco	4.00	4.35	6.00	4.00	4.00	5.60	3.75	6.40	5.15	....	6.80	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	8.56
Baltimore	4.10	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.63	4.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Kansas City and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia, Baltimore; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Milwaukee, Pittsburgh, Baltimore, Norfolk; 150-1049 pounds in Los Angeles; 300-4999 pounds in Portland, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities; 750-1500 pounds in Kansas City.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy.

SAE Hot Rolled Alloy Bars: Base, 1000 or 2000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Nov. 9

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$19.15 5 0 0	$30.45	3 11 6
Basic bessemer	.....	19.59	2 6 0
Hematite, Phos. .03-.05	20.11 5 5 0	.....	.....
Billets	$28.25 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	43.57 11 7 6	58.58	6 17 6
Standard rails	$36.39 9 10 0	$48.99	5 15 0
Merchant bars	1.88c 11 0 0	2.85c	7 10 6
Structural shapes	1.71c 10 0 0	2.77c	7 6 0
Plates, †¼ in. or 5 mm.	1.87c 10 18 9	3.69c	9 14 0
Sheets, black, 24 gage or 0.5 mm.	2.22c 13 0 0	4.04c	10 12 6°
Sheets, gal., 24 ga., corr.	2.69c 15 15 0	4.79c	12 12 0
Bands and strips	2.09c 12 5 0	2.66c	7 0 0
Plain wire, base	3.33c 19 10 0	3.04c	8 0 0
Galvanized wire, base	3.98c 23 5 0	3.61c to 3.66c	9 10 0 to 9 12 6
Wire nails, base	....	3.52c	9 5 0
Tin plate, box 108 lbs.	$ 5.84 1 10 6	.....	.....

British ferromanganese $100.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich §§Mark	
Fdy. pig iron, Si. 2.5	$18.96	4 19 0(a)	$14.81	679.30	$24.60	750	$25.20	63
Basic bess. pig iron	17.71	4 12 6(a)	.....	....	.....	...	27.80 (b)	69.50
Furnace coke	4.40	1 4 2	4.91	225	6.63	202	7.60	19
Billets	28.25	7 7 6	22.43	1,029	28.21	860	38.60	96.50
Standard rails	1.62c	9 10 0	1.41c	1,405	2.06c	1,375	2.38c	132
Merchant bars	1.98c	11 12 0††	1.30c	1,304	1.65c	1,100	1.98c	110
Structural shapes	1.78c	10 8 0††	1.27c	1,268	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	1.87c	10 19 3††	1.65c	1,650	2.06c	1,375	2.29c	127
Sheets, black	2.52c	14 15 0§	1.96c	1,958‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.95c	17 5 0	2.85c	2,850	4.05c	2,700	6.66c	370
Plain wire	1.62c	9 10 0	2.00c	2,000	2.48c	1,650	3.11c	173
Bands and strips	2.11c	12 7 0††	1.44c	1,444	1.95c	1,300	2.29c	127

†British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	17.00
Bos. dock No. 1 exp.	18.25-18.50
New Eng. del. No. 1	18.00-19.00
Buffalo, No. 1	21.00-21.50
Buffalo, No. 2	19.00-19.50
Chicago, No. 1	18.00-18.50
Chicago, auto, no alloy	16.75-17.25
Chicago, No. 2 auto	15.00-15.50
Cincinnati dealers	16.00-16.50
Cleveland, No. 1	19.00-19.50
Cleveland, No. 2	17.50-18.00
Detroit, No. 1	†16.00-16.50
Detroit, No. 2	†15.00-15.50
Eastern Pa., No. 1	20.50-21.00
Eastern Pa., No. 2	19.00-19.50
Federal, Ill.	15.50-16.00
Granite City, R. R.	16.50-17.00
Granite City, No. 2	15.50-16.00
Los Angeles, No. 1	14.50-15.00
Los Angeles, No. 2	13.50-14.00
L. A., No. 1 f.a.s.	16.00-17.00
L. A., No. 2 f.a.s.	15.00-16.00
N. Y. dock No. 1 exp.	17.50
Pitts., No. 1 (R. R.)	24.00-24.50
Pittsburgh, No. 1	22.00-22.50
Pittsburgh, No 2	20.00-20.50
St. Louis, R. R.	18.00-18.50
St. Louis, No. 2	15.50-16.00
San Francisco, No. 1	15.50-16.00
San Francisco, No. 2	14.50-15.00
Seattle, No. 1	14.50-15.50
Toronto, dirs., No. 1	11.25
Valleys, No. 1	20.50-21.00

COMPRESSED SHEETS

Buffalo, new	19.00-19.50
Chicago, factory	17.50-18.00
Chicago, dealers	16.00-16.25
Cincinnati, dealers	15.50-16.00
Cleveland	18.50-19.00
Detroit	†17.50-18.00
E. Pa., new mat.	20.50-21.00
E. Pa., old mat.	18.00-18.50
Los Angeles	12.00-12.50
Pittsburgh	22.00-22.50
St. Louis	13.50-14.00
San Francisco	14.00-14.50
Valleys	20.00-20.50

BUNDLED SHEETS

Buffalo, No. 1	19.00-19.50
Buffalo, No. 2	16.50-17.00
Cleveland	14.50-15.00
Pittsburgh	20.00-20.50
St. Louis	12.00-12.50
Toronto, dealers	9.75

SHEET CLIPPINGS, LOOSE

Chicago	12.00-12.50
Cincinnati dealers	11.00-11.50
Detroit	†12.50-13.00
St. Louis	10.50-11.00
Toronto, dealers	6.50

BUSHELING

Buffalo, No. 1	19.00-19.50
Chicago, No. 1	16.75-17.25
Cincin., No. 1, deal.	12.00-12.50
Cincinnati, No. 2	5.00- 5.50
Cleveland, No. 2	12.50-13.00
Detroit, No. 1, new	†16.00-16.50
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	5.00- 5.50

MACHINE TURNINGS (Long)

Birmingham	7.50
Buffalo	13.00-13.50
Chicago	10.75-11.25
Cincinnati, dealers	7.00- 7.50
Cleveland, no alloy	11.50-12.00
Detroit	†9.50-10.00
Eastern Pa.	14.00-14.50
Los Angeles	4.00- 5.00
New York	†8.00- 8.50
Pittsburgh	14.50-15.00
St. Louis	7.00- 7.50
San Francisco	5.00
Toronto, dealers	5.50- 6.00
Valleys	12.50-13.00

SHOVELING TURNINGS

Buffalo	15.00-15.50
Cleveland	12.50-13.00
Chicago	11.00-11.50
Chicago, spcl, anal.	12.50-13.00
Detroit	†12.00-12.50
Pitts., alloy-free	17.50-18.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston district	†6.75- 7.50
Buffalo	11.50-12.00
Cincinnati, dealers	6.00- 6.50
Cleveland	12.00-13.00
Eastern Pa.	12.50-13.00
Detroit	†9.50-10.00
New York	†8.00- 8.50
Pittsburgh	13.50-14.00
Toronto, dealers	5.50- 6.00

AXLE TURNINGS

Buffalo	17.50-18.00
Boston district	†10.50-11.00
Chicago, elec. fur.	18.50-19.00
East. Pa. elec. fur.	19.50-20.00
St. Louis	13.50-14.00
Toronto	6.00- 6.50

CAST IRON BORINGS

Birmingham	7.00- 7.50
Boston dist. chem.	†9.50- 9.75
Buffalo	11.50-12.00
Chicago	10.50-11.00
Cincinnati, dealers	6.00- 6.50
Cleveland	12.00-13.00
Detroit	†9.50-10.00
E. Pa., chemical	14.50-15.00
New York	†8.00- 8.50
St. Louis	7.00- 7.50
Toronto, dealers	5.00- 5.50

RAILROAD SPECIALTIES

Chicago	21.25-21.75

ANGLE BARS—STEEL

Chicago	20.50-21.00
St. Louis	21.00-22.00

SPRINGS

Buffalo	23.50-24.00
Chicago, coil	22.00-22.50
Chicago, leaf	20.50-21.00
Eastern Pa.	26.00-26.50
Pittsburgh	27.00-27.50
St. Louis	20.50-21.00

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	23.50-24.00
Chicago (3 ft.)	21.00-21.50
Chicago (2 ft.)	21.50-22.00
Cincinnati, dealers	23.00-23.50
Detroit	†24.50-25.00
Pitts., 3 ft. and less	27.00-27.50
St. Louis, 2 ft. & less	21.50-22.00

STEEL RAILS, SCRAP

Boston district	†15.50-16.00
Buffalo	21.00-21.50
Chicago	18.00-18.50
Cleveland	22.00-22.50
Pittsburgh	24.00-24.50
St. Louis	18.00-18.50
Seattle	18.00-18.50

FROGS, SWITCHES

Chicago	18.00-18.50
St. Louis, cut	18.00-18.50

ARCH BARS, TRANSOMS

St. Louis	20.00-20.50

PIPE AND FLUES

Chicago, net	12.50-13.00
Cincinnati, dealers	12.50-13.00

RAILROAD GRATE BARS

Buffalo	14.00-14.50
Chicago, net	11.00-11.50
Cincinnati, dealers	9.50-10.00
Eastern Pa.	17.50-18.00
New York	†13.00-13.50
St. Louis	13.00-13.50

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	21.50-22.00
St. Louis, No. 1	12.50-13.00
St. Louis, No. 2	16.50-17.00

FORGE FLASHINGS

Boston district	†12.25-12.75
Buffalo	19.00-19.50
Cleveland	17.50-18.00
Detroit	†15.00-15.50
Pittsburgh	20.00-20.50

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	21.50-22.00

LOW PHOSPHORUS

Cleveland, crops	23.50-24.00
Eastern Pa., crops	25.50-26.00
Pitts., billet, bloom, slab crops	29.00-29.50

LOW PHOS. PUNCHINGS

Buffalo	22.00-22.50
Chicago	21.00-21.50
Cleveland	20.00-20.50
Eastern Pa.	26.00-26.50
Pittsburgh	25.50-26.00
Seattle	15.00
Detroit	†17.50-18.00

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00
Boston	†17.00-17.50
Chicago	20.00-20.50
New York	†18.50-19.00
Eastern Pa.	24.00-24.50
St. Louis	20.00-20.50

STEEL CAR AXLES

Birmingham	20.00-21.00
Boston district	†18.50-19.00
Chicago, net	22.00-22.50
Eastern Pa.	25.00-25.50
St. Louis	22.00-22.50

LOCOMOTIVE TIRES

Chicago (cut)	20.00-20.50
St. Louis, No. 1	17.50-18.00

SHAFTING

Boston district	†18.75-19.00
New York	†18.00-18.50
Eastern Pa.	24.50-25.00
St. Louis, 1¼-3¾".	19.50-20.00

CAR WHEELS

Birmingham	13.50-14.00
Boston dist., iron	†15.00-15.50
Buffalo, steel	23.50-24.00
Chicago, iron	18.00-18.50
Chicago, rolled steel	20.50-21.00
Cincin., iron, deal.	18.50-19.00
Eastern Pa., iron	22.00-22.50
Eastern Pa., steel	25.50-26.00
Pittsburgh, iron	21.00-21.50
Pittsburgh, steel	27.00-27.50
St. Louis, iron	20.00-20.50
St. Louis, steel	21.00-21.50

NO. 1 CAST SCRAP

Birmingham	13.00-13.50
Boston, No. 1 mach.	†16.50-17.00
N. Eng. del. No. 2	17.00-17.50
N. Eng. del. textile	20.00-25.00
Buffalo, cupola	19.00-19.50
Buffalo, mach.	20.00-20.50
Chicago, agri. net	14.00-14.50
Chicago, auto net	15.50-16.00
Chicago, railroad net	15.00-15.50
Chicago, mach. net	15.50-16.00
Cincin., mach. deal.	19.00-19.50
Cleveland, mach.	20.00-21.00
Detroit, cupola, net	†16.50-17.00
Eastern Pa., cupola	22.00-23.00
E. Pa., mixed yard	19.00-19.50
Los Angeles, net	15.00-16.50
Pittsburgh cupola	22.00-22.50
San Francisco, del.	12.50-13.00
Seattle	16.00-16.50
St. Louis, breakable	15.00-15.50
St. Louis agri. mach.	18.25-18.75
St. L., No. 1 mach.	19.00-19.50
San Francisco	14.50-15.00
Toronto, No. 1, mach., net, dealers	16.00-16.50

HEAVY CAST

Boston dist. break.	†14.75-15.00
New England, del.	16.00-17.00
Buffalo, break	16.50-17.00
Cleveland, break, net	15.25-15.75
Detroit, auto net	†17.50-18.00
Detroit, break.	†14.50-15.00
Eastern Pa.	20.00-20.50
Los Ang., auto, net.	14.50
New York, break	†16.00-16.50
Pittsburgh, break	18.00-18.50

STOVE PLATE

Birmingham	9.00-10.00
Boston district	†14.00-14.50
Buffalo	15.00-15.50
Chicago, net	11.50-12.00
Cincinnati, dealers	10.25-10.75
Detroit, net	†11.00-11.50
Eastern Pa.	17.50-18.00
New York, fdy.	13.00-13.50
St. Louis	12.00-12.50
Toronto dealers, net	11.00-11.50

MALLEABLE

Birmingham, R. R.	14.00-15.00
New England, del.	11.50-12.50
Buffalo	21.50-22.00
Chicago, R. R.	20.50-21.00
Cincin., agri., deal.	15.50-16.00
Cleveland, rail	23.00-23.50
Eastern Pa., R. R.	21.50-22.00
Los Angeles	12.50
Pittsburgh, rail	23.50-24.00
St. Louis, R. R.	17.00-17.50

Ores

Lake Superior Iron Ore

Gross ton, 51½ %
Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract.	9.00-10.00

Foreign Ore
(Prices nominal)

Cents per unit, c.i.f. Atlantic

Manganiferous ore, 45-55% Fe., 6-10% Mn.	14.00-15.00
North African low phos.	14.00
Spanish, No. African basic, 50 to 60%	14.00
Chinese wolframite, short ton unit, duty paid	$23.75-25.00
Scheelite, imp.	$25.00-26.00
Newfoundland fdry. 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.00-26.00

Manganese Ore

Including war risk but not duty, cents per unit cargo lots.

Caucasian, 50-52%	50.00-51.00
So. African, 50-52%	50.00-51.00
Indian, 49-50%	nom.
Brazilian, 43-45%	nom.

Molybdenum

Sulphide concentrates, per lb. Mo. contained, mines.	$0.75

Sheets, Strip

Sheet & Strip Prices, Pages 86, 87

Pittsburgh—Sheet and strip backlogs extend through the fore part of next quarter. Orders are in excess of producing capacity but generally are being placed far in advance, with the result current shipments are accommodating consumers' immediate needs in most cases. Production is steady at about 80 per cent for sheet mills and slightly less for strip mills. Galvanizing operations hold at 79 per cent.

Cleveland—Mills see no slackening in sheet and strip requirements of consumers and distributors. First quarter bookings continue to increase, capacity this period being entirely absorbed by previous orders. Automotive needs, already heavy, will increase further with settlement of labor troubles.

Chicago—First quarter bookings of sheets and strip are fairly heavy, with some producers naming February and March deliveries on some grades, principally cold-rolled material. Best demand is from the automotive industry and farm equipment builders.

New York—Sheet consumers continue to press actively for delivery against previous commitments but are more conservative in placing first quarter tonnage. Only in a few instances can business be accepted for delivery this year. This includes stainless, backlogs of which generally extend through December. Most sheet fabricators still are unable to accumulate stocks. Export demand continues to gain, with prices strong. No. 24 black sheets usually are 3.55c, f.a.s. Some eastern cold strip mills are booking orders for shipment well into February at open prices, with total new business continuing substantial.

Philadelphia—Additional business is being booked for first quarter, but demand is less pressing. It is indicated from consuming sources that automotive coverage at low prices this spring will extend at least through next quarter. The navy has changed from stainless steel to galvanized mild steel for stack housings, hatch covers, doors, etc., for certain vessels now under construction.

Buffalo—Leveling off in new business has not affected production. Mills are booked to capacity the remainder of the year and have substantial orders for first quarter. Increased demand for strip is reported for railroad specifications.

Cincinnati—An increase in first quarter orders is expected with the opening of books for that period, with a larger proportion of export tonnage looked for. Constant pressure for deliveries is pushing mill operations.

St. Louis—Mills report increased pressure for delivery of sheets and strip. Movement of galvanized sheets to the building industry and general manufacturing trade is substantial. Some first quarter contracting continues on the part of buyers anxious to be assured of deliveries.

Birmingham, Ala.—Considerable volume of sheets is being booked by local mills, and production remains at approximately 90 per cent. A sizable backlog has been built up in sheets, and output of strip, while not involving any backlog thus far, is in fair volume.

Plates

Plate Prices, Page 86

Chicago—Demand is good, with numerous interests making first quarter coverage. Railroad demand, and freight car builders' requirements rank high among consumer needs. Builders of storage tanks and miscellaneous structures are taking sizable tonnages and are among those seeking first quarter coverage at prices in effect when shipment is made.

Boston—With practically all railroad repair shops in New England operating at a higher rate, notably the New Haven's plant at Readville, Mass., plate releases by carriers are heavier. Shipyard specifications are maintained with a moderate increase in miscellaneous buying. Paper mill needs are slightly improved, but specified public work, such as tanks, is light. Deliveries average three to four weeks, with the 2.35c base price more in evidence.

New York—Large export inquiries are pending. However, current prices of 2.70c, f.a.s., on tank plates and 2.80c ship plates, plus inability of mills to give shipment within the five to six weeks requested are deterring foreign buying. Freight car work continues outstanding in domestic demand. Ship needs are confined largely to specifications against old orders, although 12,000 tons will be required for hull and superstructure of a tanker placed by Atlantic Refining Co. with Sun Shipbuilding & Dry Dock Co., Chester, Pa.

Vessels under construction to specifications of the American Bureau of Shipping as of Nov. 1 totaled 245 of 1,184,360 gross tons, against 126 vessels of 459,775 gross tons a year ago. This compares with 179 vessels of 1,044,580 gross tons on Oct. 1.

Philadelphia—Pending tonnage includes 5400 tons for two ships placed a week ago with a nearby yard. Buying is slower, with some interests able to make deliveries on universal plates within four weeks, sheared plates in six weeks. It is estimated not more than 10 per cent of plates bought recently are going into stock. Pennsylvania and Reading railroads have completed purchases for present programs.

Birmingham, Ala.—Tonnage from railroads, tank manufacturers and shipbuilding has resulted in unusual bookings of plates. Pullman has placed orders here for current carbuilding requirements, while Gadsden has received considerable business in plates for shipbuilding, with considerable backlog accumulated.

Seattle—Inquiry for plates is fair, shops reporting usual seasonal overhaul and repair jobs. No large projects involving plates have developed and tonnages pending are nominal.

San Francisco—The outstanding plate letting went to Consolidated Steel Corp., 700 tons of 24 and 30-inch welded steel pipe for Burbank, Calif. Awards totaled 960 tons and brought the aggregate for the year to 90,506 tons, compared with 38,382 tons for the same period a year ago.

Plate Contracts Placed

700 tons, 24 and 30-inch welded steel pipe, Burbank, Calif., to Consolidated Steel Corp., Los Angeles.

150 tons, ten tanks, Vulcan Detinning Co., Neville Island, Pa., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Plate Contracts Pending

Unstated, steel caisson for Bonneville dam; bids to division United States engineer, Bonneville, Oreg., Dec. 1.

Bars

Bar Prices, Page 86

Cleveland—Extremely heavy shipments and apparent unlikelihood of sharp price advances next quarter find no reflection in buyers' requests for expedited deliveries. Business in certain sizes of bars still can be accommodated late this quarter, but a sold-out condition is the rule and tonnage for shipment next period is accumulating.

Chicago—Demand for carbon and alloy bars is prominent among orders for first quarter delivery. Automotive coverage is reported smaller relatively than had been expected.

Little tonnage is being booked for shipments this quarter as the largest mills have long since been sold out. Farm equipment makers are specifying more heavily.

Boston — Demand for alloy steel bars continues brisk, including 100 tons of chromium-molybdenum stock for the Springfield, Mass., arsenal, bids in. Shipyard, railroad, machine tool and miscellaneous buying is well maintained and in some instances shows slight gains. Deliveries are more extended, and a small tonnage may go over for first quarter shipment. Airplane builders are more active in alloy inquiry.

New York—Most consumers look for little price change next quarter but are specifying freely to assure themselves of adequate supplies. Some users have been sorely pressed for stocks, including certain bolt and nut producers.

Philadelphia—Mills are booked well into January and continue to experience difficulty satisfying consumer needs the balance of this quarter. Export demand is more active, with 2.40c f.a.s., generally obtainable. Jones & Laughlin Steel Corp. has booked 100 tons of steel rods for Frankford arsenal, proposal 436, at 3.87c.

Birmingham, Ala.—Bar output is at capacity under current conditions. Most tonnage is coming from highway construction and miscellaneous uses calling for reinforcing bars.

Pipe

Pipe Prices, Page 87

Pittsburgh — Standard pipe production is close to capacity, although oil country goods lag. Dealers with consigned stocks report heavy demand for construction work and miscellaneous uses is matching mill shipments. Mechanical tubing is active, and producers of pressure tubing have fair backlogs.

Boston—Cast pipe buying has improved slightly, with municipalities having blanket contracts extending original estimates in releases in some instances, the latter to be shipped before the end of the year. Merchant steel pipe demand is steady, but not heavy, while wrought pipe business is largely routine.

New York—The local department of water supply, gas and electricity has closed bids on about 1800 tons of 48-inch steel pipe for installation in Queens. A substantial tonnage will be required for the Bladek housing project in lower Manhattan, on which bids have just been taken for heating and plumbing contracts. Cast pipe export inquiry from South America is heavy, with considerable tonnage booked for Panama. Domestic buying is less active.

Philadelphia—Oil companies are covered three to six months ahead. Export inquiry includes 50,000 tons for South America.

Birmingham, Ala. — Pipe plants remain generally on a four to five day week, with bookings involving mostly comparatively small orders. Most tonnage continues to come from west coast points. Some increase is noted in current inquiries.

Seattle—Recent lettings have been better than normal and little business is now pending. Quincy, Wash. has purchased 6000 feet of various sized water mains.

San Francisco—Demand for cast iron pipe has lessened and no new inquiries of size are appearing. Those in close touch with the situation are of the opinion that many municipalities and private companies will begin to enter the market shortly for 1939 requirements to protect themselves under prevailing prices. Awards aggregated 827 tons and brought the year's total to 35,141 tons, compared with 29,133 tons for the corresponding period in 1939.

Cast Pipe Placed

715 tons, 2 to 8-inch, San Francisco; 345 tons of 8-inch to United States Pipe & Foundry Co., Burlington, N. J.; 370 tons of 2 to 6-inch universal pipe to Central Foundry Co., Birmingham, Ala.

300 tons, 12-inch, Worcester, Mass., to R. D. Wood & Co., Florence, N. J.

105 tons, various sizes, procurement division, treasury department, Boston, to Warren Pipe Co., Everett, Mass. Same department has inquiries up for 104 tons additional.

Cast Pipe Pending

200 tons, 10-inch, state of Massachusetts; taking bids.

Steel Pipe Pending

1800 tons, 48-inch steel pipe, New York department of water supply, gas and electricity; bids closed.

Wire

Wire Prices, Page 87

Pittsburgh—First quarter business is coming in rapidly. Merchant markets still are active, although forward buying is mostly in manufacturers' grades. Deliveries are running behind in most merchant products, with prices firm. Nonintegrated mills report wire rod needs are being amply covered.

Cleveland—While pressure for delivery continues heavy, buyers' requirements are being met more readily and a more orderly market prevails. Producers of rods, wire and wire products have little capacity open for remainder of the quarter, but only a small tonnage has been booked for shipment after Dec. 31. Jobbers' stocks of merchant products are not regarded as excessive, considering the state of their business.

Boston—While buying has slackened, demand continues brisk and well diversified. Substantial first quarter backlogs are accumulating. It is becoming evident mills will not be able to ship all current quarter tonnage before Dec. 31. Consumption has made further gains.

New York—Consumption of wire for finished manufactured goods is conservatively estimated at 75 per cent of production, or close to capacity in numerous departments. Practically all buying is for first quarter delivery at open prices and backlogs for that period are rising. Despite high production some tonnage booked for shipment this quarter will undoubtedly be carried over beyond Dec. 31.

Philadelphia—Mills are booked well through fourth quarter on both wire and nails. Some shortages of wire rods are reported.

Birmingham, Ala.—The Fairfield wire mill is operating at virtual capacity, with all items in good demand. Considerable backlog is reported and bookings are at open prices, subject to ability to deliver.

Rails, Cars

Track Material Prices, Page 87

Railroad buying has moderated from the crest of the past few weeks, though rail and car purchases continue. Award of 50,000 to 60,000 tons of rails, plus accessories by the New York Central is expected this week. The Lackawanna has distributed 1500 tons of accessories.

Car awards include 100 gondolas by the Youngstown & Northern and 100 dump cars by the Union. The navy is inquiring for one flat and one box car.

Car Orders Placed

Delaware, Lackawanna & Western, 1100 freight cars, 500 fifty-ton hoppers and 100 seventy-ton gondolas to American Car & Foundry Co., New York, and 500 fifty-ton box to Magor Car Corp., Clifton, N. J.; this is in correction of a report in last week's issue.

Union Railroad Co., 100 air dump cars, 60 to Differential Steel Car Co., Findlay, O., and 40 to Magor Car Corp.,

Clifton, N. J.

Youngstown & Northern, 100 seventy-ton gondolas, to Magor Car Corp., Cliffton, N. J.

Car Orders Pending

Navy, one 50-ton flat and one 50-ton box car; bids Nov. 28 under schedule 7726.

Rail Orders Placed

New York, New Haven & Hartford, recently noted as having divided 15,000 tons of rails equally between Carnegie-Illinois Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.; has closed on approximately 1500 tons of accessories, to various sellers.

Buses Booked

Denver Tramrail Corp., Denver, 35 trolley coaches to J. G. Brill Co., Philadelphia.

Transportation Commission, Seattle, 235 trackless trolleys and 102 gas and diesel buses, distributed as follows: J. B. Brill Co., Philadelphia. and Pacific Car & Foundry Co., Seattle, 100 trackless trolleys; Twin Coach Co., Kent, O., 135 trackless trolleys; General Motors Corp., Detroit, 25 diesel-powered 40-passenger buses and 13 gas-powered 40-passenger buses; Twin Coach Co., 34 gas-powered 32-passenger buses; Kenworth Motor Truck Corp., Seattle, 30 buses, 32-passenger, five with fluid gear transmission.

Shapes

Structural Shape Prices, Page 86

Pittsburgh — Fabricated shape awards continue to increase. Public works orders are more numerous, with railroad bridges also prominent. Inquiries are sustained. Fairly prompt delivery is available on plain shapes.

Cleveland—Activity in small building work is keeping fabricators and shape producers busy. Deliveries on plain material are better than on most other products. Large inquiries in the immediate district are few. Carnegie-Illinois Steel Corp. is expected to furnish 2400 tons of piling for two sections of the Cuyahoga river straightening project, and American Bridge Co. has booked 5000 tons for a Cleveland Electric Illuminating Co. plant.

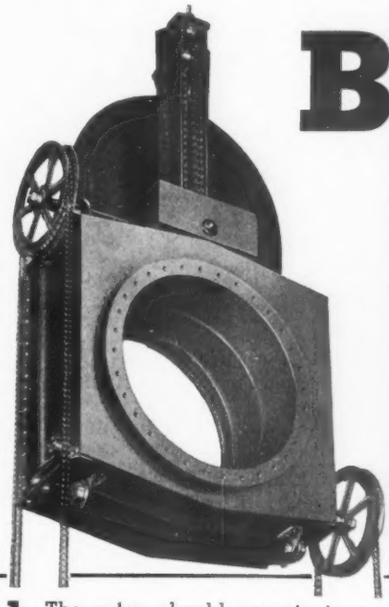
Chicago — Structural material is in good demand by railroads, freight car builders and miscellaneous interests, but structural erectors, with few substantial jobs pending, are not requiring very encouraging tonnages. Light shapes are moving better than heavy.

Boston—Structural contracts approximate 1250 tons, with 800 tons for an assembly shop addition, naval station, Newport, R. I., outstanding. Bulk of volume was placed with shops outside the New England district. Inquiry is gradually mounting, small projects accounting for most lots. Several thousand tons are required for the National Fire Insurance Co. building, Hartford, Conn.

Seattle — No important projects have been released for figures although general construction activity has increased demand for small tonnages. Lettings of the last 60 days have given shops ample work to the end of the year. Tonnages pending are the lowest in several months.

Philadelphia — Inquiries have slumped sharply, although a fair tonnage is pending. More work is expected from utilities; a local interest will double power output and a new generating plant is planned at Harrisburg, Pa.

San Francisco — The shape market was active and 7831 tons were placed, bringing the aggregate for the year to 141,555 tons, compared



BRASSERT
PLATE TYPE
GAS VALVE
fulfills all these ten commandments

1 The valve should operate in a straight line rather than as a goggle.

2 The valve structure should have sufficient beam strength to require no support from the ground.

3 The valve must be self-contained in that it must embody an expansion joint, the retracting mechanism being completely independent of the structure of the valve body. Movement of the clamping flange must be positive in both directions.

4 The valve opening must be equal to the diameter of the pipe, and must be free from obstruction to the flow of gas.

5 The valve plate must be sufficiently stiff to avoid accidental distortion, and to maintain a tight joint. It must be capable of positive mechanical movement in both directions. It should be capable of full counterweighting when operating vertically.

6 The valve must be capable of location and operation in any position, vertical, horizontal or inclined. For this reason the valve plate should be positively moved away from engagement with its seat at the beginning of motion, and should be returned to contact at the end of motion.

7 The construction must be adapted to the use of either hot or cold gas.

8 The operating mechanism of the valve should be on the outside, and capable of examination. The mechanism should be capable of lubrication, and should be dirt-proof.

9 The contacting surfaces should be of non-corrosive material.

10 The valve should be capable of rapid manual operation without undue exertion by the operator.

For further particulars, address us at Chicago or Pittsburgh.

H. A. BRASSERT and COMPANY

310 South Michigan Avenue
CHICAGO, ILLINOIS

436 Seventh Avenue
PITTSBURGH, PENNA.

with 134,381 tons for the same period last year. Pending business exceeds 16,600 tons, most of which, it is expected, will be placed before the end of the year.

St. Louis—Structural shapes continue quiet. Lettings are few and the outlook for the next several weeks is not particularly bright. Fabricators are operating 25 to 35 per cent and are buying only for immediate needs.

Shape Contracts Placed

5000 tons, power plant, Cleveland Electric Illuminating Co., to American Bridge Co., Pittsburgh.

4000 tons, transmission towers, Bonneville dam, Oregon, to American Bridge Co., Pittsburgh.

2000 tons, bridge project SP-6006, Calumet, La., to Mt. Vernon Bridge Co., Mt. Vernon, O.

1975 tons, Western avenue bridge superstructure, Chicago, to American Bridge Co., Pittsburgh.

1150 tons, trashracks, bulkheads, etc., Fort Peck dam, Montana, to Bethlehem Steel Co., Bethlehem, Pa.

800 tons, addition, assembly shop, naval station, Newport, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; Trednnick-Billings Co., Boston, contractor, $390,-750, spec. 9334.

750 tons, addition to power house, for Central Illinois Light Co., East Peoria, Ill., to Wisconsin Bridge & Iron Co., Milwaukee.

650 tons, warehouse, National Sugar Refining Co., Long Island City, N. Y., to Ingalls Iron Works Co., Birmingham, Ala.

625 tons, state bridge 1842, Peru, Ind., to Pan-American Bridge Co., New Castle, Ind.

550 tons, grade crossing elimination, Union road, Cheektowaga, N. Y., to Bethlehem Steel Co., Buffalo.

550 tons, viaduct, for Chicago, Milwaukee, St. Paul & Pacific railroad, Brompton, Iowa, to Wisconsin Bridge & Iron Co., Milwaukee.

500 tons, bridges 352.86 and 17.05, for Chicago, Burlington & Quincy railroad, to American Bridge Co., Pittsburgh.

385 tons, grade crossing, Gardenville-Williamsville, N. Y., to Bethlehem Steel Co., through Border Building Co., Buffalo.

360 tons, stock cellar building, for Tivoli Brewing Co., Detroit, to Whitehead & Kales Co., Detroit.

360 tons, state highway project, RC-2576, Erie county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; C. P. Ward Inc., Rochester, N. Y., general contractor.

355 tons, three state highway bridges, Bloomington, Ill., to A. F. Anderson Iron Works, Chicago.

320 tons, bridge project 2511-A, Georgetown, S. C., to Virginia Bridge Co., Roanoke, Va.

300 tons, platform and stairs, Gulf Refining Co., Port Arthur, Tex., to Mosher Steel Co., Dallas, Tex.

300 tons, addition to office building, for Pacific Telephone & Telegraph Co., Sacramento, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

270 tons, bridge No. 5971, Minnesota, to Minneapolis-Moline Power Implement Co., Minneapolis.

265 tons, bridge 587, Missouri Pacific railroad, Pueblo, Colo., to Kansas City Bridge & Iron Co., Kansas City, Mo.

235 tons, state highway project RC-4078, Tioga county, New York, to Lackawanna Steel Construction Corp., Buffalo, through Maple City Lumber & Supply Co. Inc., Hornell, N. Y.

235 tons, warehouse, Newark, O., to Indiana Bridge Co. Inc., Muncie, Ind.

205 tons, ice arena, Akron, O., to Burger Iron Co., Akron.

200 tons, magazine buildings, Philadelphia, for United States government, to Phoenix Bridge Co., Phoenixville, Pa.

200 tons, replacement of girders, bridges 35.03 and 34.30, Collier, W. Va., for Pennsylvania railroad, to American Bridge Co., Pittsburgh.

200 tons, state bridges 433 and 434, Waupaca, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

200 tons, bridges, route 53, Dunklin county, Missouri, to Reynolds Mfg. Co.

190 tons, bridge FAGM-113B, Waupaca, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

180 tons, bridge, Medford, Minn., for Chicago, Milwaukee, St. Paul & Pacific railroad, to Minneapolis-Moline Power Implement Co., Minneapolis.

170 tons, state bridge BR-50-45, Midland, O., to Case Crane & Kilbourne Jacobs Co., Columbus, O.

170 tons, apartment building, for W. W. Vicinus, Rochester, N. Y., to American Bridge Co., Pittsburgh.

170 tons, pony truss span, Chicago, Milwaukee, St. Paul & Pacific railroad, Moravia, Ia., to Minneapolis-Moline Power Implement Co., Minneapolis.

155 tons, wash house, Trommer brewery, Brooklyn, to Reiche & Penner, Brooklyn.

150 tons, addition, Memorial hospital, Orange, N. J., to H. R. Goeller Inc., Hillside, N. J., through Hugh Montague & Co., Newark.

150 tons, building 124A, Aluminum Co. of America, Massena, N. Y., to Empire Construction Co., New York.

150 tons, housing project, Lexington, Ky., for city, to Snead Architectural Iron Works, Louisville, Ky.

145 tons, additions to building F, Westinghouse Electric & Mfg. Co., Sharon, Pa., to Keystone Engineering Co., Pittsburgh.

135 tons, Frye bridge, Springville, N. Y., to Lackawanna Steel Construction Co., Buffalo.

120 tons, St. Andrew's church, Flushing, L. I., to Belmont Iron Works, Eddystone, Pa.

115 tons, bridge over Woolper creek, Erlinger, Ky., for state, to Midland Structural Steel Co., Cicero, Ill.

105 tons, power plant drop No. 3, Imperial Irrigation District, El Centro, Calif., to Consolidated Steel Corp., Los Angeles.

110 tons, theater, Williamstown, Mass., to Haarmann Steel Co., Holyoke, Mass.; E. J. Pinney Co., Springfield, Mass., contractor.

100 tons, two tobacco warehouses, Johnson City, Tenn., to Interstate Foundry & Machine Co.

Shape Awards Compared

	Tons
Week ended Nov. 11	**25,105**
Week ended Nov. 4	**27,360**
Week ended Oct. 28	**17,827**
This week, 1938	**15,503**
Weekly average, year, 1938	**21,568**
Weekly average, 1939	**22,775**
Weekly average, October	**21,730**
Total to date, 1938	**913,697**
Total to date, 1939	**1,024,909**

Includes awards of 100 tons or more.

Shape Contracts Pending

6500 tons, turret shop, navy yard, Brooklyn, N. Y.; bids Nov. 15 on steel direct.

5302 tons, including shapes, machinery, sheaves, ropes and steel grid flooring, Passaic river bridge, Newark-Kearny, N. J.; American Bridge Co., Pittsburgh, low at $1,099,505.62, bids Nov. 10.

2400 tons, piling, contracts Nos. 13 and 20, Cuyahoga river straightening, Cleveland; Great Lakes Dredge & Dock Co., Cleveland, low for general contract, Carnegie-Illinois Steel Corp., Pittsburgh, expected to furnish steel.

2100 tons, drafting and office building, federal government, Washington.

1660 tons, bridge near Redding, Calif., Shasta county, Calif., for the state; bids Nov. 22.

1000 tons, sheet steel piling, second graving dock, navy yard, Bremerton, Wash.; general contractor, Macco Construction Co. and Case Construction Co., Clearwater, Calif.

900 tons, alterations to bridges, various locations, for Chicago, Milwaukee, St. Paul & Pacific railroad.

750 tons, including plates, filtration plant, Los Angeles; Griffith Co., 1060 South Broadway, Los Angeles, low on general contract at $1,632,992.

570 tons, three state highway bridges, Illinois; bids in.

450 tons, state bridge RC-4087, Oswego and Onondaga counties, New York.

375 tons, state bridge FAGH-4084, Craigville, N. Y.

365 tons, building, General Electric Realty Co., Chicago; bids in.

360 tons, H columns, Salinas river bridge, Monterey county, California, for the state; bids Nov. 22.

350 tons, state bridge PSC-5975, Monroe, N. Y.

325 tons, dumping board with ramps, New York, for city.

250 tons, polymer finishing and storage building, for E. I. du Pont de Nemours, Carney's Point, N. J.

250 tons, roof trusses, gymnasium, Northwestern university, Evanston, Ill.

250 tons, underpass, Jefferstown, Ky., for state.

210 tons, building, for New England Telephone & Telegraph Co., Springfield, Mass.

210 tons, building R-11, for Resinous Products & Chemical Co., Philadelphia.

200 tons, exchanger and heaters, for Max B. Miller Co., Ponca City, Okla.

170 tons, foundations and floors, building 18, for navy, Brooklyn, N. Y.

160 tons, state bridge RC-4085, West Danby, N. Y.

160 tons, county home, Bradford county, Pennsylvania; bids Nov. 10.

155 tons, state bridge 666, Jefferson, Wis.

150 tons, state highway bridge, Columbia county, Pennsylvania; bids Nov. 17.

150 tons, wide flanged steel beams, bureau of supplies and accounts, navy department, Washington, delivery Mare Island, Calif.; bids Nov. 21, schedule 7739.

140 tons, machine shop and addition to engine house, for Chicago & North Western railway, Council Bluffs, Iowa.

135 tons, garage building, for Terre Haute City Lines, Terre Haute, Ind.

130 tons, state highway bridge, Lehigh

county, Pennsylvania; bids Nov. 17.

125 tons, state bridge A-472-2/3, Walworth, Wis.

Reinforcing

Reinforcing Bar Prices, Page 87

Pittsburgh—Prices show occasional weakness, although the market generally is strong. Delivery continues a problem, holding up construction work in some instances. Inquiries as well as orders are fairly steady but show some seasonal letdown.

Chicago—Awards are headed by 1800 tons for the Chicago building of General Electric Co. Tonnage of recent awards is higher, but incoming projects are not as prominent. Potential demand, however, is bolstered by further subway requirements and extremely heavy needs of the city filtration plant construction.

Boston — Purchases are mostly small, few exceeding 50 tons. Total volume of bridge and highway work pending in New England is estimated at under 400 tons. Pending work, however, is heavy, housing projects taking several thousand tons. Prices are well maintained.

New York—Concrete bar prices, unusually firm in recent weeks, weakened in a transaction involving several hundred tons, the 2.15c base price being shaded materially. However, this appears to be an exception, the bulk of tonnage moving at firm quotations.

Philadelphia—Business is less active, with government work still outstanding. Prices are well maintained.

Seattle — The largest reinforcing contract pending is for the graving dock at Puget Sound navy yard, general contract just awarded to Macco Construction Co. and Case Construction Co., Clearwater, Calif., on their joint low bid of $1,956,000. There is an improved market for small lots of concrete bars, due to general construction activity but at the moment no important tonnages are up for figures.

San Francisco — While pending business exceeds 15,700 tons, awards for the week were only 870 tons. This brought the total for the year to 147,689 tons, compared with 127,171 tons for the corresponding period in 1938.

Concrete Bars Compared

	Tons
Week ended Nov. 11	**8,712**
Week ended Nov. 4	**16,514**
Week ended Oct. 28	**9,112**
This week, 1938	**2,287**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**9,895**
Weekly average, October ..	**10,421**
Total to date, 1938	**301,358**
Total to date, 1939	**445,316**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

3500 tons, Vladek housing project, New York, to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Co., New York, contractor, $4,605,659.

1800 tons, building, General Electric Co., Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; James Stewart Co., contractor.

1100 tons, powder magazines, Savanna, Ill., U. S. ordnance department, to Bethlehem Steel Co., Bethlehem, Pa.; Midwest Construction & Asphalt Co., contractor.

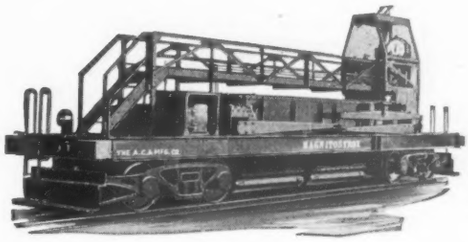
1000 tons, housing projects, Peoria, Ill., to Laclede Steel Co., St. Louis.

280 tons, viaduct, New York Central railroad, 11th avenue, New York, to Seaboard Steel Products Corp., New York; Elmhurst Contracting Co., New York, contractor.

200 tons, reservoir, Pekin, Ill., to Laclede Steel Co., St. Louis; G. E. Tillman, contractor.

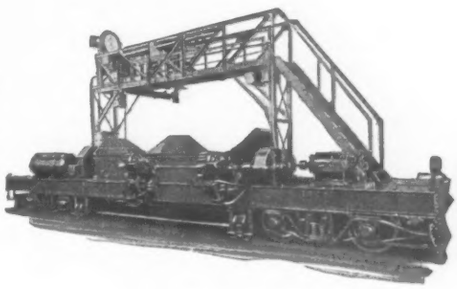
200 tons, apartments, Clarendon Corp.,

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levellers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

Behind the Scenes with STEEL

Holiday Note

■ One of our more violent punsters around the office insists (at every given opportunity) that November 23 this year is *Franksgiving Day.*

Have Any Ideas?

■ The Readers Service Department—that mysterious source of any and all information—was stopped colder than a pouter pigeon last week with this very lucid request from a well-known research organization: *One of our clients wishes to find something relatively new, and capable of development on a promising scale, and would be willing to invest a fair amount of capital. We thought you might be able to help us with some ideas you may know of.* To us he sounds like a perfect fall guy for that seedless watermelon we told you about last week.

Facts On Foundries

■ If you are in any way interested in selling the foundry industry you should run, not walk, to the nearest typewriter and dash off a note to *The Foundry,* 833 Penton Building, Cleveland, asking for a copy of their new market study. It is the most comprehensive and accurate picture of a single industry we've ever seen.

Space Filler

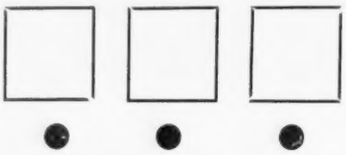
■ Radio news commentator one evening last week: *The Russian-Finnish negotiations are rushin' to a finish.* Which is Norway for anyone to talk unless he wants to get in Dutch.

The Fly Flew 15 Miles

■ The junior high school problem on the fly and the bicycles lost us a reader. From Pittsburgh came an anonymous note written across a tear sheet of the problem, instructing us "to go straight to hell." Such language in the first place—tsk, tsk! But even worse is the thought of a grown man tearing his hair in mental anguish and finally taking it all out on us, just because his office boy probably gave him the answer in about two and a half seconds.

Invitation To Insanity

■ And so, before proceeding a pica farther we warn you this one has grayed our hair (singular) and upset our digestion for a solid week and we still can't get the answer. But it supposedly can be done. The implements of mental torture below represent three ordinary square houses with a fire hydrant in front of each house. The problem is to run a hose from each hydrant to each house without one hose crossing any other.



This one really has us down, and we hereby offer a year's subscription to STEEL to anyone who gets the correct solution.

Copy Chasing

■ The way we feel this morning we misread that Socony ad on pages 52-53 and thought we'd found a new cure. When our eyes finally focused, though, it didn't say "Gargle for D. T.'s!" Much more soothing is that lovely thing on p. 45 who will pay a premium according to Wickwire-Spencer. American Steel & Wire (p. 65) and Bethlehem (p.3) could exchange headlines this week and still both have what it takes.

Add: Menagerie

■ One loyal reader and animal lover objected to our forgetting American Agile's prize creation in our menagerie last week. We tried to apologize to the "thing" (see page 100, Nov. 6) and lost two fingers.

SHRDLU

Madison, Wis., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, building, National Aniline Co., Rensselaer, N. Y., to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.; White Construction Co., contractor.

117 tons, Klamath river bridge, Humboldt county, California, for state, to Soule Steel Co., San Francisco.

115 tons, bars and mesh, state highway project RC-2576, Erie county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; C. P. Ward Inc., Rochester, N. Y., general contractor.

100 tons, state highway project, Livingston county, New York, to Concrete Steel Co., New York; Hudson Valley Construction Corp., Avon, N. Y., contractor.

100 tons or more, housing projects, Latonia Terrace and Jacob Price Homes, Covington, Ky., to Truscon Steel Co., Youngstown, O.; Whittenburg Construction Co., Louisville, Ky., contractor. Bedford Foundry & Machine Co., Bedford, Ind., awarded structural steel.

Unstated, 372-foot state bridge, Clackamas county, Oreg., to unstated Portland house; McNutt Bros., general contractors.

Reinforcing Steel Pending

3000 tons, second graving dock, navy yard, Bremerton, Wash.; general contract to Macco Construction Co. and Case Construction Co., Clearwater, Calif.

1500 tons, 3200-man barracks, air corps, Hickam Field, T. H.; bids Nov. 21.

635 tons, bridge near Redding, Shasta county, Calif., for the state; bids Nov. 22.

565 tons, Salinas river bridge, Monterey county, California, for the state; bids Nov. 22.

500 tons, state of Missouri highway projects; bids Nov. 17.

500 tons, plant, Quaker Maid Co., Terre Haute, Ind.

450 tons, sewer, East Nineteenth street, Queens, N. Y.

420 tons, two state highway projects, King county, Washington; bids at Olympia, Nov. 21.

300 tons, turret shop, navy yard, Brooklyn; Mill Basin Construction Co., New York, low.

270 tons, bridge, Harvard, Ill.

250 tons, seawall, navy yard, Brooklyn; Centaur Construction Co., New York, low.

250 tons, Piney branch sewer, unit 6, Washington.

200 tons, Weber apartments, Detroit.

185 tons, viaduct, Shasta county, California, for the state; bids Nov. 22.

182 tons, Panama canal, schedule 3715; bids Nov. 10.

150 tons, housing project, MacComb, Miss.; W. T. Reed, Belzonie, Miss., low on general contract.

150 tons, building, Bunge Grain Co., Minneapolis.

136 tons, dumping platform and stairs, department of sanitation, New York; bids Nov. 17.

130 tons, building, Mead Johnson Co., Evansville, Ind.

107 tons, sorting platform, American Railway Express Co., New York; bids

Nov. 14.

105 tons, highway work in Cochise county, Arizona, for state; bids Nov. 16.

Unstated, 178-foot, 4-span state bridge, Landers Fork, Mont.; Tom McGeever, Butte, general contractor.

Pig Iron

Pig Iron Prices, Page 88

Pittsburgh—Production continues to increase, with several blast furnaces scheduled to be blown in shortly. Both merchant and steelworks demand are active. Coke supplies generally are adequate, although a few additional beehive ovens are being started in the Connellsville district. Prices are firm and unchanged.

Cleveland — Increased operations of foundries have required them to enlarge their tonnage of iron on hand and on order, but there is little evidence of excessive inventory additions. Heavier shipments are meeting the upturn in consumption, with deliveries well sustained. Business continues to be booked for movement this quarter.

Chicago—Sellers feel shipments this month will equal October and possibly exceed it slightly. Sales are a trifle slower and continue in small, fill-in lots. No indication of a change in price for first quarter is seen. Steel mills are taking the most tonnage now, with malleable foundries next, although gray iron foundry demand is also good. By-product foundry coke shipments are steady.

Boston — Foundry operations are high, and consumers are taking substantial shipments. When new buying appears prompt delivery is asked, indicating such buyers have small supplies. There has been little buying in anticipation of a first quarter price advance. Consumers are taking the view quotations will not be changed, at least until steel companies announce next quarter prices.

New York—Sellers are taking little new business, but shipments continue heavy to accommodate the rise in the melt the past few weeks. Buyers show little concern over possibility of a scarcity in supplies or higher prices next quarter. Most inquiry is from abroad, particularly from Scandinavian countries. Export orders are not comparable with inquiries but are of fair size.

Philadelphia—Rumors of a possible first quarter price rise are discounted, and new business therefore is confined to fill-in requirements. Shipments are heavy, and the melt, based on coke deliveries, is at least 80 per cent. A strike has closed one pipe foundry. Increased export business is seen, with inquiries reported from both South America and Europe. Japan is not active in the market.

Buffalo—Releases are holding at peak levels. Most foundries are working four or five days a week. As a result, despite production of 78 per cent, little iron is being accumulated by foundries and none is being added to producers' inventories.

Cincinnati—Shipments are holding near the October rate but are off moderately from September, when the movement was stimulated by closing out of low-priced contracts. Consumption also is steady, being slightly above 60 per cent of district capacity. Little interest is shown in first quarter buying.

St. Louis—Shipments are at the best rate so far this year. The melt is sustained, with some steel foundries more active, particularly those on railroad work. Engine and machinery makers are operating full time and jobbing foundries are

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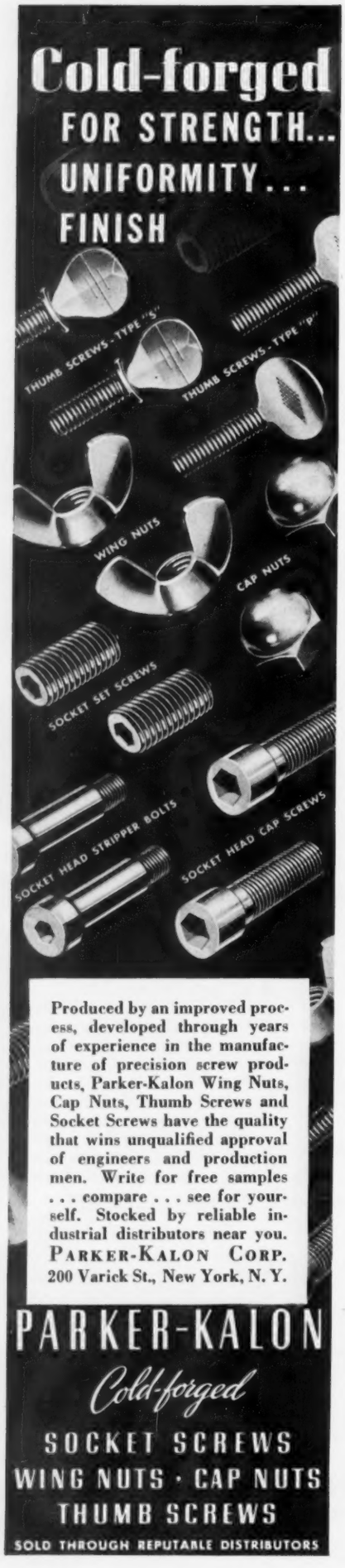
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busier. First quarter pig iron inquiries are fairly large.

Birmingham, Ala.—All 18 of the district's blast furnaces are pouring, with shipments for October considerably up from September.

Scrap

Scrap Prices, Page 90

Pittsburgh—Demand is light despite capacity steelmaking, and most grades are off 50 cents to $1. However, supplies at the lower figures are practically nil, and brokers are unwilling to sell short except at higher prices. Mills are releasing shipment against contracts but are inactive in new buying.

Cleveland—Tonnage purchase by a local steelmaker at $20.50 for No. 1 heavy melting and $20 for compressed sheets indicates the market is firm at quoted levels. Further arrivals by lake continue to modify upward movement of prices here.

Chicago—Prices are easier, most grades being off 50 cents, including heavy melting steel. Dealers generally are receiving $18 for No. 1 steel, and the last mill purchase was at $18.50. Both mills and foundries are well supplied for the present by recent coverage, but consumption continues heavy.

Boston — Prices reveal scattered advances, but most grades have leveled off. For export the trend is slightly firmer. A Spanish ship is loading 6000 tons for shipment to Spain, the first vessel from that country to touch here since its Civil war. More No. 1 melting steel scrap is bringing $18.50, dock, and in some instances slightly better. The Worcester steelworks is taking in some No. 1 at $18.50, delivered, although the price is dependent on point of shipment. Chemical borings are up 50 cents, also breakable cast for Pennsylvania shipment, while busheling is up 25 cents. No. 1 cast is $19 to $20 delivered at various New England points.

New York—Prices are easier on more grades for domestic shipment. There is little new buying, but most eastern mills are taking shipments against old orders. Railroad lists are bringing lower prices this month. Foundry buying is spotty although operations are higher. Export buying for barge delivery is at unchanged prices but is not brisk. Absence of shipping facilities is affecting the placing of additional export orders now under negotiations.

Philadelphia—Steelmaking grades are easier, with business done in No. 1 steel at $20.50 and $21 and in No. 2 at $19 and $19.50. Steel specialties are unchanged. A lot of 5000 tons of new compressed automotive sheets brought $20.75. Some export buying is noted at $20.50 for No. 1 and $19 for No. 2, Port Richmond.

Buffalo—Prices are holding, with principal activity in dealer coverage of recent sales. Shipments are heavier, following removal of an embargo by one consumer in order to accommodate receipt of two boatloads of about 10,000 tons of scrap. Current quotations were substantiated by a sale of 5000 tons of No. 1 steel on the basis of the prevailing $21 to $21.50 range. This is $1 less than was paid on the last sale almost a month ago.

Detroit — Beyond upward adjustments of 50 cents in No. 1 busheling and forge flashings, the market is quiet and firm. The leading consumer continues to take shipments on a restricted basis, but is not particularly interested in booking further tonnages.

Cincinnati—Prices are unchanged, with heavy consumption and steady shipments to consumers a sustaining influence. Mills have covered early needs and are resisting higher prices.

St. Louis—The market is quiet, but prices are steady and trading is the most orderly in two months. A west side mill has bought No. 2 steel at $16.50, off $1 from the preceding purchase. Industrial and country scrap are less plentiful than two weeks ago, but railroad offerings are heavier.

Birmingham, Ala. — While the market continues strong, it is uneventful, with considerable sales being made at unchanged prices.

Seattle—The market is uncertain following its rapid rise during the last 60 days. Prices are a trifle easier, generally quoted at $17 to $18. Japanese buyers are reconciled to the 50 per cent increase in c.i.f. prices and are placing orders for small tonnages. Mills are also in the market but foundry requirements are nominal.

Ferroalloys

Ferroalloy Prices, Page 88

New York—A slight decline in ferromanganese shipments is looked for in November, due solely to the shorter month. On a daily basis a sustained movement is indicated, in view of the steelmaking outlook. Most leading sellers continue to quote $100, duty paid, for contract and spot tonnage, although as noted previously, at least one seller is quoting spot at $110. Domestic spiegeleisen, 19 to 21 per cent, holds at

$32, Palmerton, Pa., and 26 to 28 per cent at $39.50. The market on other ferroalloys generally is firm.

Ferrotungsten is easier at $2.00 to $2.10 per pound and tungsten metal powder at $2.50 per pound in 200-pound lots and $2.60 in smaller quantities. These reductions are due to the fact that tungsten ore prices have not advanced as sharply as alloy manufacturers have anticipated in figuring replacement value of stocks.

Warehouse

Warehouse Prices, Page 89

Pittsburgh—Business still is increasing, and some warehouses are having difficulty obtaining sufficient tonnage from mills to meet requirements. Prices are firm.

Cleveland — Demand holds near the late-October rate, with sustained consumption and deferred mill deliveries expected to maintain warehouse business through November.

Detroit—Orders which have gone to warehouses because of delayed mill deliveries are smaller than in other districts but help sustain sales in a period when tool and die shops are out of the market.

Chicago—Demand is substantially unchanged since the first of the month. Orders continue heavy and November bookings are expected to come within 2 to 5 per cent of October volume.

Buffalo — Distributors report no letup in buying, sales being at a new peak despite holidays last week. Prices are steady.

Seattle—Sheets and light plates are reported in strongest demand. Volume is rather heavy and steady although local houses are working with an unstable price structure, several items below normal levels. Several large public works projects in Washington state are expected to furnish considerable tonnage for local houses for several months.

Boston—Volume in most products is heavy, alloys being notably active in small orders. Warehouses in some instances are hard put to keep alloy stocks balanced. Prices are generally stronger, although some large tonnages bring out mixed quotations.

New York — Buying continues heavy, gains last month being maintained. Warehouses are booking substantial export orders.

Philadelphia—Sales continue active but show little change from October. No further price changes are in prospect.

Cincinnati — Replenishing of warehouse stocks has enabled normal service on the demand which is steadily maintained at the October levels. Sales are well diversified, although tapering in building items is apparent. Prices are unchanged.

St. Louis—Business is leveling off near its recent peak, with demand heavy. Oil country goods continue active, largely reflecting activity in the new Illinois fields.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 87

Bolt and nut specifications continue brisk, with operations averaging about 80 per cent. Fourth quarter business still is being booked. Prices are strong but unchanged, with first quarter books not yet opened. Meanwhile, business for that period is not being accepted, but orders carried over into 1940 will be shipped at prices then in effect. Additional business is coming from railroads, car builders and shipyards.

Steel in Europe

Foreign Steel Prices, Page 89

London—(*By Cable*) — Basic pig iron production of Great Britain is being fully absorbed by steelworks. Consumption of foundry iron is expanding but the supply is sufficient at the present rate. Pooling of ore and scrap purchases is being considered to counteract the high price of imported materials. Pig iron inquiries from foreign markets are plentiful but no tonnages are available.

The Continent reports export de-

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mand is active from various sources.

Tin Plate

Tin Plate Prices, Page 86

Tin plate operations are steady at 95 per cent. There is no definite word yet as to first quarter prices, but some revision is felt necessary, due to increasing raw material costs. First quarter tonnage is being accepted readily at prices prevailing that period, and schedules are being filled rapidly.

Manganese Ore

Iron Ore Prices, Page 90

New York—High grade Caucasian and South African manganese ore are holding nominally at 50 to 51 cents per unit without duty but including war risk insurance. The general tone of the market is strong, due primarily to conditions abroad. There is little demand as leading consumers still have substantial reserves.

Nonferrous Metals

NEW YORK—Nonferrous metal sales increased moderately last week as actual consumption holds at the highest rate attained in at least two years. Shipments generally are moving on schedule with only minor postponements reported. Tin declined steadily, reaching new lows since August, but all other markets remained firm.

Copper—Leading producers continued to allocate business to customers due to limited supplies for nearby delivery rather than to any unusually heavy demand. Electrolytic held at 12.50c, Connecticut, in the producers' market and at 13.00c for resale metal in the outside market. Japan bought moderate tonnages in the export market which held unchanged at 13.00c, f.a.s. Cop-

Nonferrous Metal Prices

Nov.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
4	12.50	12.50	12.12½	53.00	47.00	5.50	5.35	6.50	20.00	14.00	35.00
6	12.50	12.50	12.12½	52.00	46.25	5.50	5.35	6.50	20.00	14.00	35.00
7	Holiday										
8	12.50	12.50	12.12½	51.00	46.25	5.50	5.35	6.50	20.00	14.00	35.00
9	12.50	12.50	12.12½	50.00	46.00	5.50	5.35	6.50	20.00	14.00	35.00
10	12.50	12.50	12.12½	49.50	45.75	5.50	5.35	6.50	20.00	14.00	35.00

*Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.50c Conn. copper

Sheets

Yellow brass (high)	19.06
Copper, hot rolled	20.87
Lead, cut to jobbers	8.75
Zinc, 100 lb. base	11.25

Tubes

High yellow brass	21.81
Seamless copper	21.37

Rods

High yellow brass	15.23
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.31

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	8.37½-8.50
Cleveland	9.25-9.50
Chicago	8.75-9.00
St. Louis	8.50-8.75

Heavy Copper and Wire

New York, No. 1	10.00-10.25
Cleveland, No. 1	10.25-10.50
Chicago, No. 1	10.00-10.25
St. Louis	9.75-10.00

Composition Brass Turnings

New York	8.00-8.25

Light Copper

New York	8.00-8.25
Cleveland	8.25-8.50
Chicago	7.87½-8.12½
St. Louis	7.75-8.00

Light Brass

Cleveland	5.00-5.25
Chicago	5.62½-5.87½
St. Louis	5.00-5.50

Lead

New York	4.85
Cleveland	4.37½-4.50
Chicago	4.25-4.50
St. Louis	4.00-4.25

Zinc

New York	3.50-3.75
Cleveland	3.25-3.50
St. Louis	3.75-4.00

Aluminum

Mixed, cast, Cleveland	10.25-10.50
Borings, Cleveland	7.25-7.50
Clips, soft, Cleveland	16.00-16.50
Misc. cast, St. Louis	8.25-8.50

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.75
Standard No. 12 aluminum	14.75-15.50

per and brass mills are still operating close to capacity in most departments with some booked up to 90 days ahead.

Lead—Consumer interest in December metal improved after being rather dormant for the first 10 days after the books were opened. Many producers easily balanced their daily intakes and some exceeded them. Undertone of the market remained steady at 5.35c, East St. Louis, and 5.50c, New York, with St. Joseph Lead Co. asking the usual $1 premium on certain grades in the latter market. Actual consumption is active with October shipments estimated at about 65,000 tons.

Zinc—Producers are making freer offerings in view of the drop in unfilled orders to about 77,500 tons compared with 92,675 tons at the end of September. Prices remained on the firm basis of 6.50c, East St. Louis, for prime western. Sales are still below shipments which set a new high for recent years during October at 73,327 tons. Production of galvanized sheets has held at 79 per cent of capacity during the past month.

Tin—Record-breaking supplies are afloat to this country which has tended to weaken the price structure. Straits spot eased steadily from 53.00c at the end of the previous week to about 49.00c at the end of last week. Tin plate mills continued to operate at about 95 per cent of capacity.

Government Contracts Large Pig Tin Tonnage

■ Procurement division, treasury department, has given contract to Caswell, Strauss & Co. Inc., New York, for 1,120,000 pounds of pig tin, grade B, at 47.74 cents per pound, totaling $534,688. The purchase is made under provisions of the strategic and critical materials act.

Defines Japan's Trade with U. S.

■ AMERICA'S stake in trade with Japan today is receiving close scrutiny as a result of the administration's recent notice of intention to abrogate our 1911 commercial treaty. Significant is a report on trade between the two nations just issued by Japan Foreign Trade bureau, Chicago.

Japan has been our third best foreign customer for the past decade, ranking next to Great Britain and Canada, according to the bureau. Last year Japan imported from the United States products valued at $239,620,000; we sold to Britain $521,044,000, and Canada $467,676,000.

While our exports to Great Britain in the last ten years were declining 38.5 per cent, and to Canada 50 per cent, those to Japan fell only 7.5 per cent. In 1938 she accounted for 7.7 per cent of all American exports, against only 4.9 per cent for 1929.

Nippon is dependent upon this country for a large share of her raw cotton, iron, steel, scrap, petroleum products, machinery and automobiles. During 1938 her imports from the United States of pig iron, steel, and scrap metals amounted to $66,038,000; imports of machinery, automobiles, airplanes and parts, $49,019,000. Sales to Japan in the past two years:

(Thousands Omitted)

	1938	1937
Iron, steel and scrap...	$66,038	$104,536
Raw cotton, linters etc.	53,569	63,523
Petroleum products ...	51,809	44,821
Machinery, autos, planes	49,019	34,203
Wood, paper	7,101	19,322
Chemicals, dyes	5,728	9,433
Animals and animal products	2,803	3,642
Vegetable products, beverages	1,428	5,353
Miscellaneous	2,125	3,726

This country is the leading buyer of Japan's raw silk and an important market for her textiles, tea, canned goods, chinaware and novelties. It is notable that in 1938 American purchases of Nipponese metals and manufactured products totaled but $1,405,000.

Our favorable trade balance with the Japanese has grown steadily in recent years, aggregating $387,297,000 since 1931. Our exports and imports for the years 1929-1938:

(Thousands Omitted)

	Exports to Japan	Imports from Japan	Export Balance
1929.....	$259,127	$431,873	—$172,746
1930.....	164,570	279,040	— 114,470
1931.....	155,715	206,349	— 50,634
1932.....	134,921	134,011	+ 910
1933.....	143,435	128,418	+ 15,017
1934.....	210,480	119,252	+ 91,228
1935.....	203,283	152,902	+ 50,381
1936.....	204,348	171,744	+ 32,604
1937.....	288,558	204,201	+ 84,357
1938.....	239,620	126,820	+ 112,800

Goods we buy from Japan are virtually noncompetitive with domestic products, the report asserts. It credits the United States tariff commission with the statement that

of the $117,963,573 worth of dutiable goods imported from Japan in 1934, but 8.2 per cent or $9,713,756, were "substantially competitive."

What American business may expect in a China under Japanese influence, bureau declares, is evidenced by the trend of exports to Manchukuo since Nippon took control in 1932. In 1933 Manchukuo bought American products valued at $2,691,000; last year $17,005,000.

Economists Urge Change In Federal Labor Policy

■ "The legislation and pro-labor policy of the administration now causing the steady advance of average factory wage rates in the face of a declining or stationary farm price level, simply intensify the price distortion now current," say Allen W. Rucker and N. W. Pickering, business economists. Their conclusions are embodied in a study published by Farrel-Birmingham Co. Inc., Ansonia, Conn.

The authors continue: "If, as circumstances attending the present position of farm commodities strongly suggest, farm prices and income will not soon be raised and sustained by war-time demand, the distortion of industrial prices will retard if not prevent any widespread and protracted recovery in the near term.

"Both the Walsh-Healey and fair labor standard acts permit no expansion in working hours, the time-honored method whereby labor could increase its income per week and per year. . . . The current reduction in the working week to 42 hours automatically diminishes income of those now fully employed, virtually compelling them in self-defense to demand higher wage rates as an offset."

Their conclusion is: "In all respects, modification of present labor legislation will benefit the national economy. The farmer especially will be the gainer by reopening the domestic market for his products and balancing industrial prices with his income, sufficient to make effective a demand which could easily tax our industrial facilities to the utmost."

■ John Huntington Polytechnic institute, Cleveland, will continue the 5-day courses in arc-welding design and practice which it has sponsored in collaboration with Lincoln Electric Co., Cleveland. Courses will be offered during the weeks of Dec. 4, Jan. 8, Feb. 12, March 25, April 22, and May 27. E. W. P. Smith, welding consulting engineer, will direct the sessions.

Construction and Enterprise

Pennsylvania

CLAIRTON, PA. — Carnegie-Illinois Steel Corp., Carnegie building, Pittsburgh, plans installation of motor generator sets, heavy duty motors and controls, switchgear, regulators, conveyors, electric hoists, electric cranes and other equipment for expansion here of Irvin works. Three new mills are to be installed. Work starts soon, to be completed in 1940. Total cost, nearly $10,000,000. Company also plans construction of new steam-electric generating plant, equipped for 32,000 kilowatt hour initial capacity at its Carrie Furnace plant, Rankin, Pa. Stone & Webster Engineering Corp., 49 Federal street, Boston, and Union Trust building, Pittsburgh, has been selected to design and supervise construction of the generating station.

ERIE, PA.—Erie Meter Systems Inc., J. E. Robinson, purchasing agent, 2402 Pearl avenue, is planning 1-story, 88 x 136-foot plant, to cost over $40,000 with equipment. L. R. Olson is chief engineer.

MARCUS HOOK, PA.—Catalytic Development Co., 1608 Walnut street, Philadelphia, will let contracts soon on five industrial buildings. F. G. Frost, 144 East Thirtieth street, New York, architect.

SHARON, PA.—Westinghouse Electric & Mfg. Co., M. L. Fawcett, Sharon works manager, Sharpsville avenue, plans 164 x 165-foot factory building with equipment. Private plans; to cost about $40,000.

Massachusetts

WATERTOWN, MASS.—Industrial Finishing Corp., R. A. Campeso, 87 Water street, plans construction of new finishing plant. Private plans; estimated cost, $40,000.

Vermont

EDEN MILLS, VT.—Vermont Electric Co-operative Inc., Harry D. Bowman, superintendent, has been allotted $43,000 REA loan for 35 miles rural transmission line serving 120 members in three counties.

New York

DUNKIRK, N. Y.—Alco Products Inc., subsidiary of American Locomotive Co., 30 Church street, New York, W. C. Dickerman, president, plans $50,000 plant addition. Will use private plans.

SYRACUSE, N. Y. — Post Standard, South Warren street, plans extensive alterations, remodeling, equipment changes and additions to newspaper plant. Total cost to exceed $40,000. King & King, Denison building, architects.

New Jersey

NEWARK, N. J.—Hygienic Tube Container Corp., 34 avenue L, soon lets contract for construction of factory to cost $300,000. D. Sichel, 24 Commerce street, architect; D. Shaw, 24 Walnut street, engineer.

NEW BRUNSWICK, N. J.—Johnson & Johnson, 500 George street, will soon let contract on $800,000 1-story plant, 300 x 600 feet. R. C. Cory, 30 Church street, New York, is engineer.

Ohio

BREMEN, O.—Village, W. A. Lauffer, manager, plans construction of water softening plant. T. Kaiser, Newark, O., engineer.

CINCINNATI — City, C. O. Sherrill, manager, plans installation of four pumps to add 60,000,000 gallons daily to pumping capacity. Estimated cost about $200,000.

CLEVELAND — Phoenix Ice Machine Co., H. Bollinger, 2711 Church avenue, president, soon lets contract on $40,000 factory, 66 x 70 feet. W. G. Caldwell, Engineering building, architect.

NORTH BALTIMORE, O.—Hancock-Wood Electric Co-operative Inc., A. J. Phillips, superintendent, has been

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granted $194,000 REA allotment for 215 miles rural transmission line to serve 614 members in seven counties. W. R. Cutnaw, 520 Melrose avenue, Columbus, O., will probably be engineer.

RUSHSYLVANIA, O. — Village, Carl Williams, clerk, has approved bond issue for construction of waterworks system to cost $54,000; is filing WPA application for federal aid. C. P. Light, Van Wert, O., engineer.

TROY, O.—Hobart Mfg. Co., W. Hartley, factory manager, will install 50-horsepower steam boiler at cost of $75,000. W. E. Barrows, 1164 Reibold building, Dayton, O., engineer.

Michigan

GRAND RAPIDS, MICH. — McInerney Spring & Wire Co. sustained $500,000 fire damage Oct. 30.

Illinois

BLOOMINGTON, ILL.—Corn Belt Electric Co-operative Inc., T. H. Hafer, superintendent, has $205,000 REA fund for 203 miles rural transmission line to serve 488 members in three counties.

CHICAGO—Chicago Bridge & Iron Co., 1305 West 105th street, is rebuilding 1-story and basement assembly shop at cost of $50,000. O. A. Bailey, 1305 West 105th street, architect.

Indiana

BROOKLYN, IND.—Town, C. M. Senefeld, clerk, plans waterworks improvements, including two 300-gallons per minute well turbine pumps, steam heating plant and chlorinator. Total cost, $15,000. H. O. Garman, 836 Indiana Pythian building, Indianapolis, consulting engineer.

Delaware

EDGE MOOR, DEL.—E. I. du Pont de Nemours & Co., Wilmington, Del., plans major addition to its large titanium pigments plant here. Construction work to begin within next two months, be completed by early fall of 1940.

District of Columbia

WASHINGTON — General purchasing officer will open bids at 10:30 a.m., Nov. 16, on two heavy duty, motor driven, flat or V-belt drive rip saws, with capacity up to 26-inch diameter saw, eacn complete with starting equipment and motor; two swing type cut-off saws with motor and starting equipment; two 36-inch motor driven band saws with motor and starting apparatus.

Bids due 10:30 a.m., Nov. 24 on one overhead traveling electric crane of 15 tons capacity.

Maryland

BALTIMORE—American Brake Shoe & Foundry Co., 2001 to 2045 Laurens street, plans alterations to plant.

EASTON, MD.—Choptank Co-operative Inc., has secured additional $76,000 REA allotment to provide for expansion of present rural electrification program; will construct 80 miles rural transmission line in Caroline, Queen Anne's, Dorchester and Talbot counties.

SALISBURY, MD. — City considering bond issue for construction of incinerator to cost about $47,000. Arthur W. Boyce, mayor.

Florida

CHATTAHOOCHEE, FLA.—State institutions' board of commissioners, Tallahassee, Fla., plans installation of $45,000 steam generating unit. A. P. Michaels, engineer.

HOMESTEAD, FLA.—City has secured RFC approval on $75,000 loan for enlarging light and water plant, purchase of 600-horsepower diesel engine, necessary switchboards and lightning arresters, other equipment. Gordon W. Ivey, plant superintendent.

Georgia

ATHENS, GA.—Agricultural college, L. Dennis Penny, assistant purchasing supervisor, opens bids Nov. 16 for boiler, automatic stoker, steel stack, pump, other equipment.

North Carolina

CHARLOTTE, N. C.—Duke Power Co. has started construction on second unit of its Buck steam electric power plant near Salisbury. To have 100,000 horsepower capacity, be completed by June, 1941. Will serve eastern and northeastern section of company's system. Modern machinery to be installed; estimated cost, $6,000,000.

WINSTON-SALEM, N. C. — Weaver Fertilizer Co., Norfolk, Va., will construct plant, 142 x 188 feet, here. H. L. Bondurant Jr. to be in charge.

Tennessee

CHATTANOOGA, TENN. — Chattanooga electric power board, S. R. Finley, general superintendent, will erect warehouse and service building on 7-acre tract to house service and distribution facilities. Will cost $263,000. R. H. Hunt, Chattanooga Bank building, architect.

KNOXVILLE, TENN.—TVA has approved construction of 154,000 volt line connecting Hiwassee dam, North Carolina and Chickamauga dam, near Chattanooga, Tenn. Line is needed to provide delivery of power generated at Hiwassee dam to Authority's transmission system. Cost of line and terminal facilities at Chickamauga about $813,000.

MEMPHIS, TENN.—City, W. W. Mallory, president, light, gas and water division, receives bids Dec. 6 at office of N. N. Wade, 179 Madison avenue, secretary, for furnishing and installing additional structures, electrical equipment and apparatus for several substations. Estimated cost of entire project, $550,000. Thomas H. Allen, chief engineer.

MONROE, LA.—H. R. Hayes Lumber Co., T. A. Sanders, manager, 816 Trenton street, plans rebuilding burned plant at West Monroe soon.

West Virginia

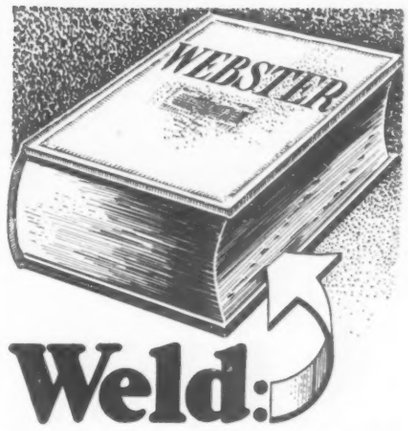
FOLLANSBEE, W. VA.—Follansbee Bros. Co. plans erection of steel finishing mill to cost about $1,200,000. Company headquarters at Third and Liberty streets, Pittsburgh.

SPENCER, W. VA.—City has been granted $35,000 WPA allotment for construction of sewage disposal plant.

WHEELING, W. VA.—Wheeling Steel Corp. plans $1,000,000 plant expansion, including installation of 635-foot buckweld mill, additional equipment. Other details not available; project to mature immediately.

Virginia

ALEXANDRIA, VA.—Virginia Public Service Generating Co., M. J. O'Connell, president, plans $2,000,000 steam generat-



Weld:

to unite, as heated metal, in one piece or mass; consolidate.

★ ★ ★

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ing station. To have 15,000 kilowatt capacity, adjacent to Virginia Public Service station, provide additional power in Alexandria-Arlington area.

SOUTH BOSTON, VA.—Carter Fabrics Corp., W. J. Carter, South Elm street extension, Greensboro, N. C., president, has acquired 58 acre site, reported contemplating erection of new rayon mill.

SUFFOLK, VA.—Community electric co-operative, L. E. Davidson, president, plans 239 miles rural transmission line, financed by $220,000 REA loan.

Missouri

BOLIVAR, MO.—Southwest Ozark electric co-operative, L. L. Alexander, representative, will complete plans soon for 319 miles rural transmission line in Polk, Webster, Greene, Dallas and Hickory counties to serve 1100 customers. Midwestern Engineering & Construction Co., McBirney building, Tulsa, Okla., consulting engineer.

KANSAS CITY, MO. — United States Engineer, Davidson building, will purchase two stage direct connected diesel driven air compressor to cost about $13,000.

KANSAS CITY, MO.—Dart Truck Co., Twenty Seventh and Oak streets, plans 62½ x 135-foot addition on two levels to present plant. R. J. Raney, 6437 Washington, architect.

ST. LOUIS—Midwest Piping & Supply Co. Inc., A. G. Stoughton, 1450 South Second street, president, is building 1-story, 28,000 square foot plant, will install cranes, other equipment. Total cost about $100,000. Will manufacture welding fittings.

ST. LOUIS—Blanton Co., Second and Spruce streets, has acquired 7-acre tract for erection of oleomargarine and vegetable shortenings plant.

Mississippi

JACKSON, MISS.—General Electric Co., Schenectady, N. Y., has acquired 14 acre site for erection of plant to manufacture new hermetically sealed beam automobile headlamp. Will construct two industrial buildings with approximately 100,000 square feet of floor area; plant will include complete glass factory. Work to begin immediately.

TUPELO, MISS. — Tombigee electric power association has been granted REA allotment to finance 100 miles rural transmission line in Lee and Itawamba counties.

Wisconsin

MENASHA, WIS. — Marathon Paper Mills is constructing a 3-story and basement, 87 x 116-foot, $75,000 building. Permanent Construction Co. is general contractor.

MILWAUKEE — Oilgear Co., milling machine manufacturer, has started work on a $40,000 addition to its plant at 1403 West Bruce street, to house welding, painting and shipping departments. New building, 1-story, 8000 square feet in area, will provide additional facilities on assembly floor.

Minnesota

CHISHOLM, MINN. — City, F. Hurt, clerk, plans construction of sewage disposal plant and incinerator to cost over $100,000. G. T. Anderson, city engineer.

COKATO, MINN.—Village, A. M. Anderson, clerk, contemplates construction of sewage treatment plant. Toltz, King & Day Inc., 1509 Pioneer building, St. Paul, consulting engineers, conducting survey for project.

MINNEAPOLIS — Minneapolis & St. Louis railroad. L. C. Sprague, Northwestern Bank building, president, plans to expend $80,000 over and above regular maintenance appropriations for new machinery. Company undertaking huge new improvement program in addition to usual expenditures.

Texas

CEDAR HILL, TEX.—City, J. C. Potter, mayor, has been granted $30,000 WPA allocation for water works system.

COLEMAN, TEX.—City plans issuance of about $50,000 bonds for light and power plant improvements.

COLORADO CITY, TEX.—Lone Wolf Electric Co-operative Inc., R. A. Brister, project superintendent, has $145,000 REA allotment for 194 miles rural transmission line in Mitchell and Nolan counties. Midwestern Engineering & Construction Co., Tulsa, Okla., engineer.

HENDERSON, TEX. — Rusk county farmers' and dairymen's association contemplates construction of $40,000 milk processing plant.

HOUSTON, TEX.—Howard Flint Ink Co., 1 Hamilton avenue, is planning a 1-story, 120 x 280-foot manufacturing plant. A. E. Harley, 1507 Stroh building, Detroit, is architect.

HOUSTON, TEX.—Lone Star Cement Co. plans installation of motors and controls, conveyors, loaders, other equipment for modernization and improvements in mill. Work to be placed under way soon; to cost $160,000.

HOUSTON, TEX.—National Steel Products Co. has been incorporated by N. A. Fitch and Jack Blalock, Gulf building, with $100,000 capitalization.

LUFKIN, TEX.—Lufkin Foundry & Machine Co., W. C. Trout, president, will soon let contract on $100,000 plant for manufacture of heavy truck trailers..

LULING, TEX.—Luling foundation will build refrigerated locker storage plant at cost of over $40,000. Morris, Noonan & Wilson, Builders Exchange building, San Antonio, Tex., architects.

SAN ANTONIO, TEX.—San Antonio Coca Cola Bottling Co., A. M. Biedenharn, manager, 123 LaFitte street, plans alteration and addition to bottling plant. Adams & Adams, Insurance building, architects.

SAN BENITO, TEX.—Wilbur Fiske Kellogg & Associates, chamber of commerce, plan $70,000 fruit and vegetable dehydration plant.

SEYMOUR, TEX.—City, Tom E. Craddock, mayor, has $200,000 for 268 miles rural transmission line. H. B. Gieb & Co., 1109 Mercantile building, Dallas, Tex., engineers.

Nebraska

BAYARD, NEBR.—Chimney Rock public power district, R. O. Chambers, president, is taking bids to 7 p.m., Nov. 29, on about 22 miles rural transmission line in Morrill county. Specifications filed with H. H. Henningson, 1904 Farnam street, Omaha, Nebr.

COLUMBUS, NEBR. — State railway commission has granted Loup river public power district, Harold Kramer, secretary, authority to construct 26¾ miles rural transmission line in Platte and Colfax counties.

MITCHELL, NEBR. — Roosevelt rural public power district, Thomas Shephard, president, is taking bids to 10 a.m., Nov. 29, on 13.25 miles rural transmission line in Sioux and Scott's Bluff counties. H. H. Henningson, 1904 Farnam street, Omaha, Nebr., engineer. Certified check 5 per cent to accompany bid.

Colorado

LOVELAND, COLO. — Poudre valley rural electric association, L. S. Gallie, manager, has secured $230,000 REA allotment to finance 219 miles rural transmission line in Larimer and Weld counties.

Pacific Coast

LONG BEACH, CALIF.—City council public utilities committee and J. W. Charleville, city manager, are considering plans for new municipal steam-electric power plant. Estimated cost about $10,600,000, including substation facilities, primary and secondary lines. Bond issue to finance project proposed.

SAN FRANCISCO—Columbia Steel Co., Russ building, plans installation of heavy duty motors and controls, conveyors, electric hoists and cranes, switch gear and other equipment for expansion and modernization in West Coast mills. Entire project to cost about $1,000,000.

MYRTLE POINT, OREG.—Coos rural electric co-operative association has $100,000 for 92 miles rural transmission line.

DAVENPORT, WASH.—Grange Milling Co. directors plan immediate reconstruction of flour mill and warehouse recently destroyed by fire with loss of $80,000. A. V. Shanks, manager.

MOUNT VERNON, WASH. — Skagit county public utilities district plans extensive improvements to water systems acquired through condemnation proceedings from Peoples Water & Gas Co., and located in Mount Vernon, Sedro-Wooley and Burlington, Wash. Mount Vernon is holding election on proposal to construct competing system.

PUGET SOUND NAVY YARD, WASH. —Commander R. E. Thomas, thirteenth naval district public works officer, will receive bids here Nov. 28 for seaplane hangar, storehouse, shop buildings and power plant for the Tongue Point, Oreg., naval air station.

SEATTLE—Transportation commission, supervising rehabilitation of municipal street railway system plans garage and shop system for trackless trolleys and passenger buses. $330,000 available. McClelland & Jones, and Thomas, Grainger & Thomas have been appointed architects; Lincoln Bouillion will prepare mechanical plans.

Canada

NEW WESTMINSTER, B. C.—Syndicate, Mayor F. J. Hume, representative, plans construction of munitions manufacturing plant on 200-acre site already purchased.

ST. BONIFACE, MAN.—Arctic Ice Co. Ltd., 156 Bell avenue, contemplates construction of $70,000 artificial ice manufacturing plant on 25-acre site.

NAPADOGAN, N. B.—Canadian National railroad, F. O. Condon, acting chief engineer for Atlantic region, planning $40,000 coaling plant. Private plans to be used.

MONTREAL, QUE.—J. Schofield, 355 McGill street, architect, will soon let contracts on steel wheel and coach shop for Canadian National railway, 360 McGill street. Estimated cost, $100,000.

Alaska

SEWARD, ALASKA—A. N. Wilson plans to rebuild salmon canning plant at Portlock recently destroyed by fire.

READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Sales Opportunity in Mexico

To the Editor:

Now that the war in Europe is an actual fact and not just a threat, Mexico, as well as all Latin-American countries, finds itself cut off from European sources of supply covering many articles that Germany, particularly, has been selling at prices many times 50 per cent under those manufactured in the United States.

There are neutral nations in Europe that have always had the inside on certain commodities because of prices, who now find themselves unable to ship to Mexico because of the danger involved.

Even though they are able to deliver merchandise here, the increased cost because of higher freight rates, war risk insurance, additional hazards that cannot be covered by war risk insurance, and indefinite delivery dates, creates a situation that should be most favorable to the American manufacturer interested in regaining the Latin-American market that has gradually been slipping away from the United States during the past few years.

Show Little Interest

Buyers in Mexico tell us they find the supplier in the United States very indifferent toward Mexican business; that they repeatedly receive replies to their inquiries saying that domestic demand in the United States has become such that they are booked up for months to come, and that sources of raw materials are so scarce that they cannot possibly commit themselves to anything in the future until they see what is going to develop. In some extreme cases important manufacturers in the United States, who have triple A ratings or better, have failed to reply to telegrams and urgent air mail inquiries from Mexican buyers.

The very prosperity of the United States for the future seems to be based on ability of the American manufacturer to produce and export, and the logical export market now and for the future is Latin America. It is a fact, of course, that the United States is more nearly self-sufficient than any other large industrial nation in the world.

Mexican Purchases Large

In the case of Mexico, in 1937 it purchased from a small number of European nations a total of $55,000,000 worth of merchandise, most of which could have been bought in the United States, except for inability of the American manufacturer to meet prices of these European nations. However, now that Europe is not in a position to supply these demands, it seems an opportune time for the United States to regain this business, and once regained it will be a long time before Europe will be able to get it back on the same percentage basis that it enjoyed during the past few years.

In a resume of trade between Mexico and the United States since 1872, the United States enjoyed only 26 per cent of Mexican imports in 1872 as against 70 per cent from Europe. However, in 1889 the United States was supplying 56 per cent and Europe only 42 per cent. When war broke out in Europe in 1914, imports from the United States jumped to 70 per cent, and as the war progressed reached 90 per cent, while imports from Europe to Mexico became as low as 8 per cent.

When the United States put on her protective tariffs in 1930, our exports to Mexico showed a sharp decline and Europe immediately started to benefit from this condition. From 1934 to 1937, exports from the United States to Mexico hung around 50 per cent and in 1930 exports from European countries to Mexico amounted to about 60 per cent of Mexico's purchases. Now that the conditions resemble those of 1914, it seems that the time is ripe for the United States again to occupy its rightful position of supplying Latin American markets.

The policy of so many manufacturers in the United States seems to be one of independence and indifference to export business. It is most unfortunate to note the number of companies attempting to export but insisting that export business must be conducted on the same basis as domestic trade. Many times we have had high salaried officials visiting this market with absolutely no knowledge of the customs of the country, the language, or desire to acquaint themselves with conditions to better the feeling between the consumer and themselves.

Europe Better Seller

On the contrary, Europe has developed the Latin-American market in a very systematic way through sending men well prepared and with knowledge of local conditions, ability to speak the language, willingness to adjust themselves and their policies to the market they are attempting to gain. This has been mainly responsible for the increased percentage of business going to Europe right out of our back yard, so to speak, and in many instances on more or less the same price basis with a much inferior quality article than we could have supplied from the United States.

H. O. JOHNSON

Secretary and Manager,
American Chamber of Commerce of Mexico,
Mexico City

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